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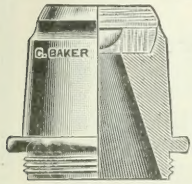

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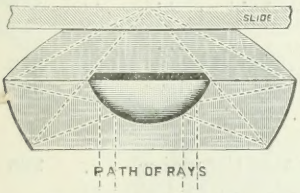

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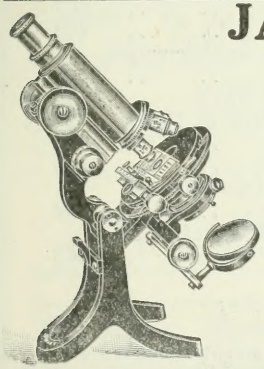

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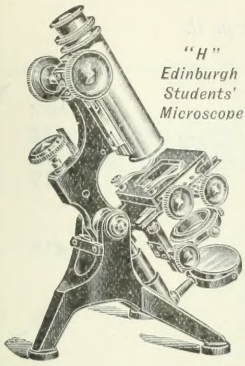

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Vol. 16.] 1920. [No. 6.

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On account of his responsible position and large area of control as Deputy Director of Medical Services, the author was able to collect and assess facts in the Mesopotamia campaign relating to the prevailing diseases which were encountered.

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The vitamine theory is discussed from a practical point of view and in conclusion the author states that in the absence of any more

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convincing theory he accepts the theory that beriberi is one of the deficiency diseases due to the absence of a special form of vitamine in the diet.

In an appendix, tables of the ration issued to the troops during the siege are given, divided into three periods.

P. W. Bassett-Smith.

Sprawson (C. A.). **Beriberi in the Mesopotamian Force.**—*Quart. Jl. Med.* 1920. July. Vol. 13. No. 52. pp. 337–355.

The author gives a very interesting description of the occurrence of beriberi in the Mesopotamian force during 1917–1919. He divides this into three groups: firstly, British cases among the land forces, of which there were 84 in 1917, and 51 in 1918; this is probably an underestimation of the total; secondly, Chinese cases among those landed, 647 in 1917, 148 in 1918, and 76 up to September 1919; thirdly ship cases among the Indian crews.

In all, the clinical evidences were very similar though in the first the nervous symptoms were more marked than the cardiac, in the third the cardiac symptoms were most prominent, whereas in the second both were well marked. He prefers the term cardio-neurotoxic syndrome to beriberi. The writer holds the view that the British cases were not due to a food deficiency, but that they were of an infective origin and gives very fully his reasons; which are chiefly that in many instances there was no evidence of any food deficiency as generally believed to be necessary for the causation of the disease, the occurrence of the cases in very short periods after landing, and the epidemic outbreaks in local areas, often following some gastro-intestinal symptoms. The Chinese cases were "latent beriberi" when landed in Mesopotamia, brought out by fatigue and depressing causes; the ship cases could generally be traced to recent vitamine deficiency. A careful study of the local distribution of cases in the tents and huts though showing often a peculiar tendency to aggregation does not definitely support the idea of infection. He places a good deal of credence in the endocrinic changes described by McCarrison as etiological factors, but does not in any way indicate what they are dependent on. Finally he emphasises the fact that many of those who came out with the full belief in the deficiency origin of the disease as dogmatically laid down by Chick, Hume and others were by experiences in Mesopotamia forced to acknowledge "that the accepted theories as to the causation of beriberi are incomplete."

It is however evident from his own showing that certain cases are undoubtedly due to easily explained vitamine deficiency in food, others were latent cases brought into evidence by local conditions, and in some the origin was difficult to explain except on an infection theory in which a neurotoxin is rapidly produced; this as shown by McCarrison may itself be dependent upon deficiency of a vital product. In all these considerations the condition of the food as taken, rather than as rationed, bears an important and often forgotten role. The article should however be carefully read by those interested in the subject.

P. W. B-S.

Hepburn (H. H.). **Clinical Analysis of 100 Cases of Early Beri-Beri.**—*Brit. Med. Jl.* 1920. Apr. 3. p. 466.

The observations were made in 1913–1914 at the Police Hospital, Bangkok, Siam. All the patients were adult Siamese males. The first symptoms noted were oedema of the feet 50 per cent., anaesthesia of the feet 43 per cent., epigastric distress 7 per cent. Cardiac enlargement at the first examination was only found in 15 per cent. The arterial tension was between 80–90 in 24 cases; the normal in healthy adult natives was 90–100. The knee jerk was involved early and the following table shows the conditions found.

	Increased.	Normal.	Diminished.	Abolished.
First examination	6	23	22	49
Later examination:				
Increased	0	1	0	0
Normal	4	10	7	2
Diminished ..	1	12	12	9
Abolished ..	1	0	3	38

The degree and extent of anaesthesia and the condition of the reflexes may fluctuate widely from day to day, recovery frequently being effected with special rapidity.

P. W. B-S.

Clair (F.). **Béribéri expérimental. Etiologie du béribéri.**—*Bull. Soc. Path. Exot.* 1920. Mar. 10. Vol. 13. No. 3. pp. 191–196.

The author who has studied beriberi in Brazil, Japan and the East Indies now describes his investigations made in Madagascar.

The disease is endemic on the East coast extending far inland, affecting most heavily the black races but none are exempt. The cases are most numerous and the mortality highest in the hot damp months between April and December. Malaria and ankylostomiasis are predisposing causes as also syphilis and alcoholism, in fact anything that lowers the vitality of the resident population. Decorticated rice is used as a principle article of diet, and in time of famine is often of bad quality; it tends to ferment in the intestine and gives rise to suppression of the normal secretions and an increase of bacterial growths with absorption of toxic products acting on the vascular system, inducing anaemia of the cerebral centres and also acting as a nerve toxin. This intoxication is less common among Europeans as they are less dependent on rice as an exclusive diet. He did not find any evidence of contagion but when many cases occur together it is due to general unhygienic and debilitating conditions present.

The indications for treatment are better and varied diet, to cure malaria and other concomitant diseases, and to prevent absorption of intestinal toxins.

P. W. B-S.

Marchoux (E.). **Béribéri et Avitaminose.**—*Bull. Soc. Path. Exot.* 1920. Mar. 10. Vol. 13. No. 3. pp. 196–199.

Following an epidemic of influenza, cases of polyneuritis with diminished sensation, oedema, cardiac hypertrophy and dilatation occurred among the contingent of 2,000 Annamites in France. Very great care had been taken to provide them with a good and varied diet differing only from that of the European in the substitution of rice for bread; nevertheless beriberi became epidemic between May and November. There were 432 cases with 13 deaths. It is noted that among the polyneuritis cases without oedema, the knee reflexes were exaggerated. The author believes that the disease is best explained on the theory that the cause was the absorption of a toxin formed in the intestine by a living germ from the ingested decayed rice, and was not due to deficiency of the accessory food factor. He however failed to isolate any specific germ but his research work was not commenced until the epidemic was nearly over. This infection theory was not supported by M. Broquet who pointed out that beriberi is exceptional among Annamite soldiers in Indo-China who received during their military service the European rations. [The outbreak of the disease following an influenza epidemic is interesting, and suggests that its appearance was the result of incipient disease favoured by lowered resistance.]

P. W. B-S.

Rodrigues (Figueiredo). **Beriberi experimental e Beriberi humano, com especial referencia ás fórmas observadas no Amazonas.** [Experimental Beriberi and Beriberi in Man, with Special Reference to its Forms as observed in Amazonas.]—*Mem. Inst. Oswaldo Cruz.* 1919. Vol. 11. No. 1. pp. 90–120. With 3 plates. [English translation at pp. 81–108 of second section.]

The author gives an historical survey of the work done by different writers both of the old and new world on this subject; of the latter Silva Lima and Torres Homem were the great pioneers.

For many years there was considerable doubt as to the real nature of the disease and its causation, the belief that it was of a febrile infective nature being strongly supported, partly owing to want of discrimination from malaria which is often prevalent in the same endemic areas.

Lima recognised that it was an afebrile, constitutional, endemic or epidemic disease, accompanied by oedema, partial paralysis, neuritis, and cardiac phenomena, causing death occasionally by asphyxia. The disease is of great importance as it is said still to cause a high mortality in the Brazilian Navy and amongst the pioneers in the uncultivated land of Northern Brazil. After a careful comparison of Eastern and Western studies there appears no doubt that the beriberi in Brazil is the same as that recognised in the East.

The author made some experiments with the cereals that are used for food in the north and interior of Brazil—rice, Indian corn, and manioc. Fowls were used and excellent plates are given showing the paralytic effects. De Assis caused polyneuritis with the

manioc flour commonly used in Brazil, but did not make experiments with Amazonas flour ; with the latter, the author's experimental birds did not show any symptoms of polyneuritis in contrast to the results obtained by WALCOTT ; he does not wish to make deductions from his own experiments as they were not complete. In a further series he proved that a diet of fine and good manioc flour is less deficient than a diet of polished rice, and Amazonas flour is less likely to induce polyneuritis than white flour of the " Surui " kind.

The evidence brought forward is very strong in support of deficiency as an etiological factor in Brazil, and an interesting case of AUSTREGESILO is quoted of so called " scorbutic polyneuritis." The observations showed that symptoms of scurvy and beriberi were present in the same individual, causing what appeared to be a new disease [very similar to the disease described by DARLING among the miners in the Rand, South Africa].

In conclusion the author considers that laws should be made to prevent the exclusive use of polished rice, or at least to put a prohibitive tax on it ; manioc flour ought to be " rigorously fiscalised " so that it will be only used in the best state of preservation, and the disease and its causes must be very fully discussed by all interested in establishing its etiology, so that the least costly and most necessary prophylactic measures may be carried out.

P. W. B-S.

W[ALSHE] (F. M. R.). **The Nervous Lesion of Beri-Beri and Its Bearing on the Nature and Cause of the Disease.** [Review.]—*Med. Sci. Abst. & Rev.* 1920. Apr. Vol. 2. No. 1. pp. 41–46.

The views of the author, who is the neurologist to the Medical Research Council, must be received with consideration. He points out that in the last conjoined report of the Lister Institute and the Research Committee beriberi was described as " a severe form of peripheral neuritis caused by the absence in the diet of an accessory food factor " but we are still ignorant of the mechanism by which this specific dietary defect gives rise to beriberi and how it is that starved fowls outlive the incubative period of the experimental form of the disease in appropriately fed birds, but die without developing it. A negative cause of disease is difficult to appreciate. He emphasises and apparently agrees with EIJKMAN'S " roundabout " explanation that the cortical substance (of rice) was necessary to neutralise the otherwise deleterious effect of a diet over-rich in starch, rather than to say it was of direct use to the body.

VEDDER'S view that the anti-neuritic vitamine is directly concerned with the nutrition or building up of the nervous system is by neuropathologists considered to be unsound, for the symptoms and morbid anatomy are those of an intoxication similar to that seen in polyneuritis produced by alcohol and diphtheria. In avian disease two factors appear necessary, namely the consumption of decorticated rice *plus* deprivation of vitamines, the latter as seen in starved fowls not being sufficient. Though believing in the vitamine deficiency theory, he thinks that the ultimate cause of beriberi may prove to be a nerve poison produced by disordered metabolism arising out of vitamine deprivation.

There is very general agreement among pathologists that the nervous lesions of beriberi are not specific for the disease and they cannot be distinguished from those of a toxic polyneuritis. L'Hermitte was emphatic on this point. Vedder and McCarrison hold that the essential lesion is not a polyneuritis but a degenerative change in the cells of the central nervous system, and these cause the symptoms. This is contrary to the experience of Oppenheim, Hamilton Wright and others, for in acute, rapidly fatal cases no lesions may be found; even the changes in the vagus, to which the sudden deaths from heart failure are attributed, are very inconstant and are problematic (T. Lewis). The heart lesions in beriberi are more probably due to early fine fatty degeneration of the muscle, as is found in diphtheria.

The chief elements of beriberi are three—nervous, cardiac and oedema. The former considered alone does not differ in any material aspect from those of other forms of toxic polyneuritis: the cardiac fall in line with those of the toxic results found in diphtheria.

By McCarrison the oedema is attributed to changes in the suprarenals and their output; against this it is stated that these organs do not differ in cases of dry and wet beriberi. [The pathological evidence in man in support of this opposing theory is up to the present too slight to make deductions from and further investigation is required.] The author rejects the purely negative theory of the disease but believes that there is a definite positive reaction of the nervous system and heart muscle to some unknown poison which may have been produced in the body. Until the metabolism in the disease has been further investigated and better understood, we shall not be able to determine its exact etiology.

P. W. B-S.

Simpson (K.). **Carbohydrate Excess and Beri-Beri.**—*Brit. Med. Jl.* 1920. May 29. pp. 735–736.

From observations on the diet of beriberi patients the author considered that in addition to the deficiency of antineuritic vitamine, carbohydrates were in excess in the diet with insufficient intake of proteins derived principally from polished rice and dried fish. He suggests that a degree of acidosis is the ultimate determining factor in the production of the neuritic symptoms, as is the case in neuritis complicating diabetes and diphtheria.

P. W. B-S.

del Rosario (Mariano V.) & Maranon (Joaquin). **The Physico-Chemical Valoration of Tikitiki Extract.**—*Philippine Jl. Sci.* 1919. Sept. Vol. 15. No. 3. pp. 221–223.

The author advocates a more careful standardisation of this extract which has proved so valuable in the treatment of beriberi in the Philippines. He gives a table showing the chemical analysis of five samples of the extracts, which vary very widely in composition. While there is this lack of uniformity, clinical results are not comparable, and further studies both clinical and analytical are required, before a determination can be made of the most desirable composition and ultimate standardisation of the drug.

P. W. B-S.

Shorten (J. A.) & Roy (Charubrata). **Report on the Anti-Beriberi Vitamine Content and Anti-Scorbutic Property of Sun-Dried Vegetables.**—*Indian Jl. Med. Res.* (Spec. Indian Sci. Congress No. 1919). pp. 60–78. With 13 plates & 2 text-figs.

Four vegetables were used in the experiments, carrots, onions, spinach and cabbage. These were first washed, then scalded or steamed for a few minutes, and dried in the sunshine in trays; after about a week the dried product was compressed into bricks and packed in air tight cases. All the samples tried had kept well, without signs of decomposition. Before cooking it is necessary to pour *boiling* water over them, and allow to soak for 20 minutes to 1 hour; then they are boiled and served in the ordinary way.

For the beriberi experiments fowls were used, with a basal diet of Rangoon rice. The conclusions arrived at were that a daily ration of 5 grams (dry) of each of the four varieties of the sun dried vegetables affords complete protection in common fowls and that the vitamine content of these substances is relatively high, also that the preparations will form a safe substitute for fresh vegetables in a ration for issue to troops.

For the anti-scorbutic experiments guinea pigs were used. The basal diet was at first oats and boiled rice, after 20 days 66⅔ c.c. of autoclaved milk per animal was added for four days, and then hay as recommended by Hess and Unger was substituted. The results showed that sun dried carrots, onions and cabbage retain to some extent their anti-scorbutic properties while in spinach these were entirely lost. It is possible that if the three former are given in sufficient quantities they would protect from scurvy for an indefinite period.

[The experiments were continued for only 42 days, which is too short a period for definite deductions. The charts of the animals' weights show that practically no growth took place. The animals used were not young, averaging 600 grams; for these experiments a young animal of 350 grams is preferable.]

P. W. B-S.

Lumière (Auguste). **Sur l'anorexie chez le pigeon nourri au riz décortiqué et le rôle des vitamines dans la nutrition.**—*Bull. Acad. Méd.* 1920. Mar. 30. Vol. 83. No. 13. pp. 310–313.

In a former communication the author described how pigeons fed exclusively on polished rice died from inanition. He now attempts to show what is the cause of the anorexia which brings this about, and incidentally the feeling of hunger.

Complete evacuation or emptiness of the stomach is followed by a feeling of returning appetite. Pigeons were given meals of 40, 60, and even 80 grams of decorticated or whole grain; in the latter it passed fairly quickly through the crop, but with the former the passage was slower and eventually so delayed that blockage, then regurgitation took place. On examination by incising the crop the decorticated food was found as a hard and dry mass whereas the whole grain was impregnated with secretions; it apparently stimulates the normal production of gland fluids. If a small quantity of yeast is added this is seen to

stimulate the secretion of the fluids very markedly and assist in the passage and the digestion of the grain as it passes down the intestine. This stasis of the undigested food explains the anorexia in pigeons. The want of nutrition is caused by the diminished glandular secretion, through the loss of stimulation normally brought about by the substances in the outer coverings of the grain, namely the vitamines. The vitamines act as excitor-secretors and also maintain the tone of the organs of digestion.

Added to this mechanical stasis, there is a deficiency of the molecular changes of the food in the intestine required for digestion and assimilation in the nourishment of the animal.

P. W. B-S.

Ogata (T.), Kawakita (S.) & Oka (C.). [**Polished Rice Disease of Birds. (Preliminary Report.)**]—*Tokyo Iji Shinshi* (*Tokyo Med. News*). 1917. Nov. 29-Dec. 20. Nos. 2154–7. 46 pages.

The experiments were made with pigeons and to a less extent with fowls. The disease occurred equally when the birds were fed on polished rice with dextrin, cane or grape sugars, but both egg white and gingelli-oil [sesame oil] gave no positive result. From starvation only no symptom of the disease was found to appear. Loss of body weight was prevented by forcible feeding, and the disease occurred even in the birds whose weight had remained unchanged or slightly increased. Declining digestive power does not seem to be necessarily a cause but it appears sooner or later in the course of the disease, and the amount of urates contained in the urine was found to increase markedly. Besides vitaminic deficiency, some toxic substance contained in the metabolic products may be a cause of the disease. In the blood the number of erythrocytes and the amount of haemoglobin decreased suddenly at the beginning of the disease. Resistance of the erythrocyte is unchanged, or even slightly heightened. Blood sugar is increased more distinctly in forcibly fed fowls than in those naturally fed. Acidosis was found in sick pigeons more markedly than in fowls: the amount of CO_2 in the blood was decreased. Dilatation of heart, oedema and pericardial dropsy were not necessarily associated with this disease, whilst starvation seemed probably responsible for these changes. The intestinal contents were characteristic in being of a green colour, which may not necessarily be due to an excessive bile secretion. Their acidity seems slightly higher than that of the controls. Changes in weight of the different visceral organs show features generally agreeing with those described by McCarrison (1917), except in the case of the birds forcibly fed on polished rice. Thus the liver and kidney show in this case an increase of weight, a result quite different from that seen in starved birds.

H. Ohshima.

SCURVY.

Hehir (P.). **Scurvy.**—*Indian Jl. Med. Res.* (Spec. Indian Sci. Congress No. 1919). pp. 79–82.

During the siege of Kut scurvy caused 1,050 cases, all but one in Indian troops. A few were reported in January 1916, from that time the incidence gradually rose and at the end of March there were 579 cases; the number then decreased. Three forms were recognised—fully developed, incipient, and latent.

All debilitating conditions, of which there were many, predisposed to the disease. Those Indian troops who ate horseflesh from the first suffered considerably less than those who, from caste or other prejudices, would not do so.

The anti-scorbutics of fresh vegetables and milk usually taken by the natives were generally unobtainable. During the siege all kinds of grass, herbs, shrubs, etc., were collected and eaten; these appeared to contain the antiscorbutic factor. A great quantity of the lemon juice supplied was undoubtedly useless, some of it being entirely artificial or chemical preparations. The disease had a most serious influence on the healing of wounds and even under antiscurvy regime, when the patients' condition generally improved, the wounds healed slowly. The mortality of the epidemic was exceptionally high, as was to be expected in the conditions to which the men were exposed.

Fresh meat alone without vegetables only delayed its appearance, for the Ghurkas who ate meat in almost the same quantity as the British soldier, from the beginning to the end of the siege, eventually suffered from scurvy to some extent. Milk curds in almost unlimited quantities saved some Indian units from the disease. It was noticed that the cure of cases was more rapid after the so commonly found oral sepsis was removed.

The increase in the meat ration for the Indian troops and the development of gardens were the two chief prophylactic measures taken after the outbreak.

P. W. Bassett-Smith.

Sheppard (A. L.). **Notes on Early Scurvy.**—*Jl. Roy. Army Med. Corps.* 1920. Sept. Vol. 35. No. 3. pp. 232–234.

While in charge of a scurvy camp in 1916 during the Mesopotamia expedition the author made and circulated these notes. They describe the typical signs and symptoms with their diagnostic value. The changes in the gums due to pyorrhoea and scurvy are detailed and are particularly useful. The total number of cases was 292; of these the gums were bad in 106 and slightly affected in 131. With regard to treatment, those on 6 ozs. of raw potatoes did best, out of all comparison with those on four ounces of fresh lime juice (made in Bombay ?) preserved with 5 per cent. alcohol and salicylic acid. Yeast proved quite useless.

P. W. B-S.

Chick (Harriette) & Dalyell (Elsie J.). **The Influence of Overcooking Vegetables in Causing Scurvy among Children.**—*Brit. Med. Jl.* 1920. Oct. 9. pp. 546–548. With 3 tables in text.

In this most interesting and Instructive account of the authors' work at the Tuberculous Hospital of v. Pirquet for Children at Vienna, they show how easy it is to make false deductions from incompletely understood facts. Forty children out of sixty four in the hospital developed scurvy while under very careful observation and dieting. A record of the diets showed that from the middle of February to the middle of April the supply of fresh vegetables was very inadequate and that apparently from this eight weeks deprivation scurvy developed. It is generally recognised that the incubation period is usually four to six months. How could this short developmental stage be explained ? The authors by careful research make it quite plain that this was largely due to the prolonged cooking of the substances which were provided in the dietary and the anomalous experience of a greater frequency of the disease among those in hospital over those outside was present as shown in the following table.

Incidence of Scurvy in relation to the length of residence in hospital.

Group.	Residence in Hospital.	Number.	Scurvy Symptoms.	Per cent.
A	6 months or more.	17	16	94
B	3 to 6 months.	21	12	57
C	Less than 3 months.	26	12	46

It is presumed that during the six months preceding the outbreak the general population were getting more anti-scorbutic substance than these hospital patients, though at that time there was everywhere a general shortage. There is also considerable evidence that the demand for anti-scorbutic is in proportion to the rate of metabolism. The diet in the clinic, which was ample in calories, led to abnormally rapid growth and this may well have had something to do with the onset of the scurvy. Suggestions are made for modifications in the method of cooking which would prevent the great loss of anti-scorbutic properties, without altering seriously the present method of preparing the food.

P. W. B-S.

Dalyell (E. J.). **Von den Gewichtskurven einiger Fälle von Säuglingsskorbut in Wien.** [Weight Curves for Cases of Scurvy in Infants in Vienna.]—*Wien. Med. Woch.* 1920. Feb. 21. Vol. 70. No. 9. pp. 419–420.

From experience gained in the children's hospitals in Vienna the author quotes one case showing that apparently in the pre-scurvy stage there was a failure to gain weight and that when a sufficiency of anti-scorbutics were supplied the weight fairly rapidly went up. Another case is described of an infant on a diet deficient only in anti-scorbutic substances, who after a period of rapid growth showed early signs of scurvy [case referred to in foregoing paper of Chick & Dalyell].

P. W. B-S.

Chick (Harriette) & Dalyell (Elsie T.). **Ueber die Verhütung des Skorbuts.** [The Prevention of Scurvy.]—*Mitt. d. Volksgsndhtsamt.* 1920. No. 1. pp. 16–17.

This is a more or less popular account of the symptoms, prevention and treatment of scurvy in infants and nursing mothers described very shortly, and is of a highly practical nature written for the benefit of the general public in Vienna. In an editorial note the great good done by these workers from the Lister Institute in London is fully acknowledged.

P. W. B-S.

Macvicar (Neil). **Notes of Scurvy and Allied Conditions.**—*S. African Med. Rec.* 1920. Aug. 14. Vol. 18. No. 15. pp. 284–287.

The occurrence of a very dry season in 1919 brought into prominence the rather high incidence of scurvy among the native races, but scurvy did not appear to be more prevalent in the miners. Of the 37 cases admitted to the Victoria Hospital, Lovedale, 15 were from labour centres and 22 cases, including women and children, had developed scurvy in their own homes. Many cases were seen which were not severe enough to require hospital treatment. The author noticed particularly a thickening and darkening of the conjunctiva symptomatic of scurvy, which was seen in persons of all ages, excepting babies at the breast. The prophylactic value of Kaffir beer (Utywala) though popularly supposed to be considerable, appears really to be very slight and this is probably due to the fact that in preparing the beer the natives boil the malted grain for about two hours, thus destroying the anti-scorbutic vitamines it originally contained.

P. W. B-S.

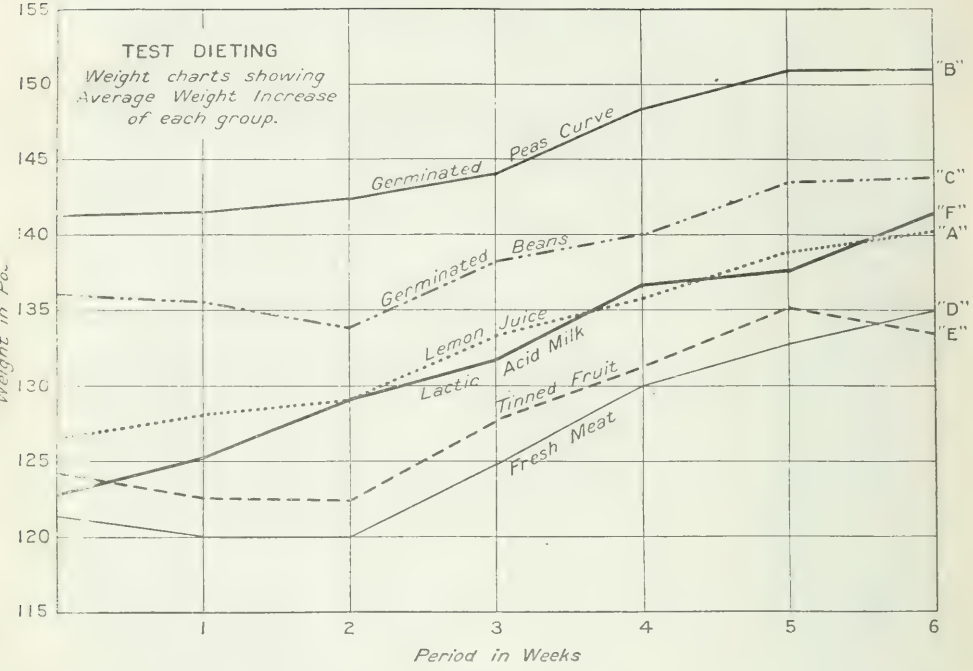
Faber (Harold K.). **Sodium Citrate and Scurvy.**—*Proc. Soc. Experim. Biol. & Med.* 1920. Vol. 17. No. 6. pp. 140–141.

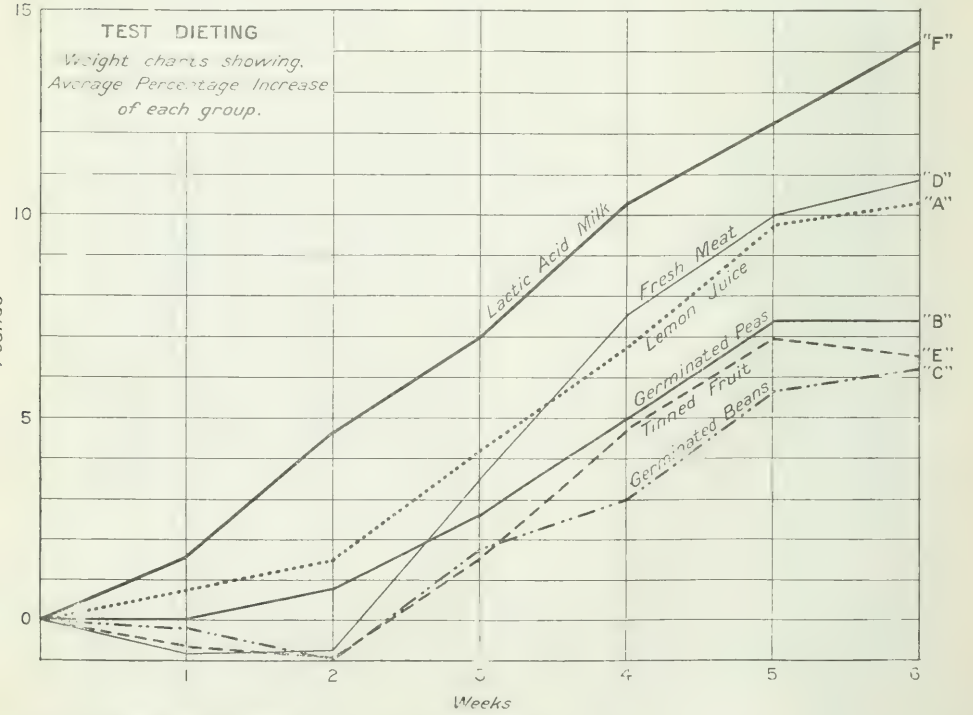
A child aged ten months who had been fed from birth on raw certified milk to which one grain of sodium citrate per ounce had been added, was under treatment for severe scurvy. Experiments were carried out with guinea pigs in which varying amounts of citrate were added. These indicate that sodium citrate even in concentration of 0·25 per cent. diminishes or destroys the small amount of anti-scorbutic substances normally present in raw cows' milk. It is noted that the results of the control on untreated milk were not in complete agreement with those of Chick, Hume and Skelton who state that guinea pigs receiving less than 50 cc. invariably develop scurvy whereas in those receiving an average of 39·1 cc., only two out of eight became affected ; it should however be noted that these experiments only lasted forty six days.

P. W. B-S.

Stevenson (A. G.). **Notes on the Etiology of an Outbreak of Scurvy in North Russia, with an Experiment in Test-Dieting.**—*Jl. Roy. Army Med. Corps.* 1920. Sept. Vol. 35. No. 3. pp. 218–223. With 2 charts.

This is a most interesting account of a human experiment carried out with great care and exactitude. The subjects were all prisoners





Curves of Weights of Groups of Scorbutic Subjects, each Group fed on a different anti-scorbutic food.

[Reproduced by permission from the *Journal of the Royal Army Medical Corps.*]

confined at Archangel and Moodiusky Island. It is shown that previous to admission the men were on a diet containing abundant vitamines but that the food supplied in jail was very deficient in quantity and its vitamine content was extremely low or negligible. It was therefore possible to determine the incubative period, namely from the time of arrest to onset of symptoms; this was four to seven months. When there was a history of previous debilitating disease, the time tended to be reduced to less than three months. 200 cases were under observation. Preserved lime juice though given in the prison had little prophylactic value.

Six groups of eight men each, with severe symptoms, living under similar conditions, were used for the test experiment which was carried out over a period of six weeks (see charts). The basal diet consisted of bread 12 ozs., oatmeal 2 ozs., fat 1 oz., meat 10 ozs., milk 2 pints, ungerminated peas or beans 8 ozs.; these vitamine-containing foodstuffs were well boiled before issue to destroy all the vitamines. The test vitamines were (1) fresh lemon juice 4 ozs., (2) germinating peas 8 ozs., (3) germinating beans 8 ozs., (4) fresh underdone roast beef 10 ozs., (5) tinned fruit 8 ozs., (6) lactic acid milk 2 pints. Results:—all cases showed a marked improvement, most marked in the lemon juice, lactic acid milk, and germinated peas groups; the germinated beans were less effective, due to digestive troubles, half an hour's cooking leaving them still hard; with the meat and tinned fruits the improvement in the clinical condition was not so rapid, though the body weights showed a marked increase (it will be noted that this again began to fall after the fifth week in the tin fruit group). Those on lactic acid milk did extremely well both as regards disappearance of scorbutic signs and gain of weight.

Conclusion—(1) Probably the best diet would be an ordinary full diet with the addition of fresh lemon juice and lactic acid milk daily: (2) germinating peas are of higher value than germinating beans: (3) fresh meat and tinned fruit have a distinct antiscorbutic value: (4) in curative properties lemon juice is superior to germinating pulses, though the latter also contain besides the vitamines important nutritive products and are therefore valuable additions to the daily ration. The action of fermented "Ideal" tinned milk in prevention and cure of scurvy would be of interest to determine.

P. W. B-S.

Comrie (John D.). **Scurvy in North Russia.**—*Edinburgh Med. Jl.* 1920. Apr. Vol. 24. No. 4. New Series. pp. 207–215. With 1 plate.

In his experience as Consulting Physician to the Forces in North Russia the author saw in 1919 a large number of cases of scurvy. The disease was practically negligible among the British troops, probably owing to the use in their dietary of germinating peas and beans, but in the Russian prisons cases were numerous and severe. The prisoners admitted to hospital all complained of not having sufficient to eat, and the carbohydrates were low for so cold a climate; there was an entire absence of fresh food and the preserved lime juice issued was useless. Interesting data are furnished as to the incubative period or time

after the first use of a deficiency diet at which scurvy symptoms were noted ; this was 4½ months, no doubt shorter than usual, owing to the depressing and unhygienic conditions and the darkness of the long arctic winter nights. Severe diseases as typhus, typhoid, influenza, etc., shortened the prescorbutic period. Some of the affected prisoners developed scurvy in one to three months. Over 80 per cent. showed swelling of the gums, and in about 86 per cent. there were well marked haemorrhages, most frequently on places subject to pressure. Deep haemorrhages in muscle were found in 50 per cent. of cases. Stiffness and contraction of joints were common. Superficial haemorrhages gave rise to ulcers with raised edges which healed very slowly. After death the heart muscle showed a marked degree of brown atrophy, with reduction in size of the ventricles ; effusions into serous cavities increase the risk for severe cases, in which sudden death is apt to occur. The blood showed the characters of secondary anaemia and lymphocytosis. For prevention the issue of germinating peas is strongly advised ; lemons (4 ozs.) or fresh lime juice (1 oz.) are invaluable if they can be obtained.

Cases of scurvy recover with great rapidity in favourable circumstances and with proper diet, most of the symptoms clearing up within a month.

P. W. B-S.

Bierich (R.). **Ueber Skorbut.** [Scurvy.]—*Deut. Arch. f. Klin. Med.* 1919. Sept. 26. Vol. 130. No. 3–4. pp. 151–171.

From a study of 1,343 cases (with six deaths) observed at the Russian Red Cross Central Scurvy Station, the author concludes that before the revolution a cure was effected with appropriate diet in 98 per cent. but afterwards only in 20 to 30 per cent. ; this he attributes to racial and mental factors. The endothelium of the capillaries appears to be primarily affected and the insufficiency of the blood producing organs seems to be secondary to the structural change of the capillaries. Treatment in many cases had to include psychotherapy, transfusion of citrated blood and splints, besides the usual dietetic measures.

P. W. B-S.

Nicolau (S.). **Etude sur une éruption folliculaire et périfolliculaire dans le Scorbut. Dermatite papulokératosique scorbutique.**—*Ann. Dermat. et Syph.* 1919. Dec. Series 5. Vol. 7. No. 11. pp. 399–434. With 3 plates.

During the winter and spring of 1918 there was a widespread epidemic of scurvy among the Roumanian troops, which gave opportunity of extended observation on the clinical characters of the disease.

In this memoir the peculiar skin eruption, which has several times been described recently, is fully discussed both clinically and histologically. The eruption, which does not go on to suppuration, is of a peculiar hard papular character and was often wrongly diagnosed as acne, folliculitis, or even a syphilide ; it is symmetrical, affects the trunk and limbs but is not found on the face, neck, armpits, hands and feet, front of chest and perineum ; the papules are rounded, light or

dark red to purple in colour. Four cases are described in detail and the plates show the characteristic distribution and appearance of the eruption. It is estimated that this peculiar dermatitis was found in about one fifth of the cases of scurvy. It is present not only in pronounced cases of scurvy, but often in the *prescurvy* condition, so that in an epidemic period or in conditions favouring the development of scurvy in prisons, ships, etc. this peculiar skin eruption would indicate the necessity of instituting anti-scorbutic measures.

P. W. B-S.

Pickard (Ransom) & Lloyd (G. W.). **The Early Manifestations of Scurvy.**—*Proc. Roy. Soc. Med.* (Sect. of Med.). 1920. Apr. Vol. 13. No. 6. pp. 43–50.

The observations were made in a divisional rest station in France during 1915. Cases of pain in the joints and muscles were noted. Some of the patients had definite anaemia and an affection of the gums with either pyorrhoea, bleeding, or loose teeth. These cases were at first thought to be of septic origin but cases with subcutaneous haemorrhages rendered a diagnosis of scurvy probable. Investigation was made to determine whether night blindness was also present, which is an early scurvy symptom. This was found in a large percentage.

These slight cases of scurvy showed a definite relationship to intermittent shortage of fresh meat and vegetables. No cases occurred in those above the rank of corporal and in only two cases had the men less than five months service in France. In the autumn of 1915 when the men were able to acquire fruit and vegetables locally the cases practically ceased.

P. W. B-S.

Zilva (S. S.) & Still (G. F.). **Orbital Haemorrhage with Proptosis in Experimental Scurvy.**—*Lancet.* 1920. May 8. p. 1008.

In infantile scurvy Still found 6 cases out of 64 showing orbital haemorrhage, 5 with proptosis. Out of 11 recorded cases 5 affected the left eye alone. Zilva at the Lister Institute has observed orbital haemorrhage in the experimental scurvy of a monkey, the left eye being affected with marked proptosis. The scurvy condition was amenable to large doses of de-acidified lemon juice, 50 cc. morning and evening, increased to 60 cc. in the morning and 50 cc. of quadruple strength in the evening.

P. W. B-S.

Finley (F. G.). **Scurvy.**—*Canadian Med. Assoc. Jl.* 1920. Mar. Vol. 10. No. 3. pp. 274–275.

Cases of scurvy are uncommon in Montreal. They mostly occur among foreigners whose chief diet consists of salt fish or meat and bread. A case in an English male is described: his diet was practically salt meat and bread alone and he stated that he had not eaten vegetables for a "long time." The symptoms were well marked. On a mixed diet with two oranges daily he rapidly improved.

P. W. B-S.

Labbé, Hagueneau & Nepveux. **Un cas de scorbut grave contracté à Paris. Etude biochimique.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1920. July. Vol. 36. No. 27. pp. 1094–1099.

The authors describe a case of acute scurvy in a man aged 51 who, owing to destitution, was forced to exist for three months on a diet of 800 grammes of bread and water, with the occasional addition of a small quantity of pig's flesh and potatoes. For two months there were no symptoms; then pains, haemorrhages, gingivitis, with loss of teeth and swellings were marked. Under treatment, the addition to the diet of two fresh lemons a day, potatoes, etc., commenced to bring about a rapid recovery.

Special records were kept for 7 days of the chemical characters of the urine and the blood, which showed evidence of imperfect metabolism of proteins. During the cure three days after admission to hospital, there was an excessive discharge of urea, 112 grammes in a day. Was this due to the breaking down of the haemorrhages caused by the disease? The author thinks not, but that it was the consequence of a retention of urea during the disease and a critical discharge of the same at the commencement of convalescence. Other authors have noticed a decrease in elimination of urea in scurvy conditions, and animal experiments have shown an excess of accumulated urea in the tissue. There was no evidence to show that the deficient protein metabolism was dependent upon the condition of the liver, but it appeared to be a result of metabolic trouble generalised throughout the whole body. A study of the blood indicated that the amount of anaemia and the histological changes in the cells were of small importance. Two further cases are quoted in one of which a cancer was present, and it is of great importance to determine whether the food deficiency condition may not be a cause of the rapid evolution of the carcinomatous growth.

[This was suggested by McCarrison, who found an early carcinoma in one of his monkey experiments.]

P. W. B-S.

i. Bassett-Smith (P. W.). **Preliminary Report of Experimental Investigation for Prevention of Scurvy in the Royal Navy.**—*Jl. Roy. Nav. Med. Serv.* 1920. Apr. Vol. 6. No. 2. pp. 117–121. With 5 charts.

ii. Bassett-Smith (P. W.). **Scurvy: With Special Reference to Prophylaxis in the Royal Navy.**—*Lancet.* 1920. May 22. pp. 1102–1105. With 4 figs. Also *Proc. Roy. Soc. Med.* (War Section). 1920. July. Vol. 13. No. 9. pp. 51–69. With 16 figs.

i. An account of successful experimental work carried out at the Royal Naval Medical School, Greenwich, with a view to obtaining an efficient, portable and palatable anti-scorbutic. The product, which is a lozenge tablet containing lemon juice, is prepared as follows:—

"The juice of fresh lemons is roughly filtered through muslin and then through filter paper under reduced pressure by means of a water pump. The filtered juice is evaporated, *in vacuo*, over sulphuric acid at ordinary

temperature (13·5°–15° C.). The residue of non-crystallizable syrup is worked up into as stiff a paste as possible with a mixture of anhydrous lactose 97 per cent., gum tragacanth 3 per cent. The paste is cut up into sections, each containing the juice of half a lemon. These are rolled, faced with the mixture, and pressed to assume the lozenge form."

[It will be noted that heat is not employed in the process.] The tablets have been kept at ordinary temperatures and at 37° C. for months. Those kept at 37° C. darken markedly in colour, probably owing to caramelization of the lactose. It was found that guinea-pigs, the animals used in the experiments, did not eat these altered tablets readily, although, once they were used to them, they took the fresh tablets without any difficulty. The tablets are fairly readily soluble in water to which a little bicarbonate of soda has been added. Guinea-pigs were given one-fifth of a tablet, i.e., the one-tenth of the juice of a lemon, daily, or 4 cc. ; but half this quantity has a protective action.

Two series of experiments were conducted, each lasting over 90 days. In the first a basal diet of oats and bran plus 60 cc. of sterilized milk and plenty of water was given. Control animals on this diet died about the fortieth day with signs of scurvy. Guinea-pigs receiving in addition either fresh de-acidified lemon juice in tablet form or raw fresh cabbage remained perfectly healthy for three months. Those on the tablets at first ceased to grow but afterwards increased in weight.

In the second series the basal diet consisted of ship's biscuits 30 gm., sterilized milk 60 cc. and lime water 20 cc. A change of diet to bran or oats was given once a week. The same results were obtained, the animals which died of scurvy showing enlarged and haemorrhagic adrenal glands with atrophy of the intestinal tract.

Six charts show the effects of feeding on the various diets. The most graphic is that which demonstrates the change which took place in animals stricken with scurvy when on the 28th day of the experiment one-fifth tablet of dried lemon juice was fed to them.

ii. This is practically the same paper but the charts have been ombined and micro-photographs show the changes in the supra-renals. Furthermore, a short but interesting résumé of the past history of scurvy in the Navy and of the recent history of the disease is given. The relationship of scurvy to other deficiency diseases is briefly discussed and DARLING's well-known diagram is reproduced [see this *Bulletin*, Vol. 5. p. 107].

A. B.

MOURIQUAND (G.) & MICHEL (P.). **Dessiccation et perte du pouvoir antiscorbutique des végétaux frais.**—*C.R. Biol. Soc.* 1920. June 5. Vol. 83. No. 19. p. 865.

Experiments were carried out with guinea pigs. A diet of 30 grams of dry barley and 10 grams of fresh " whole " barley [*herbe d'orge*] completely protected from scurvy. If the fresh whole barley added had been dried at 70° C for 48 hours, the animal died on the 26th to 48th day, showing marked bone lesions ; if the fresh whole barley was dried as above and macerated for 18 hours in distilled water and then

given, scorbutic signs with bone fractures occurred ; if the fresh whole barley was dried at low temperature (37° C) for 48 hours the same intense scurvy signs were noted—but if it had been macerated for 18 hours, the scurvy signs were very slight. From this he concludes that the original fluid contained in the fresh whole barley contains the active antiscorbutic substance, that this water of vegetation, " vivante," when lost by drying at 70° C cannot be replaced by afterwards macerating the barley, but in drying at a *low* heat (37° C) and then macerating some protective power is retained. It is as if this " living " vegetable fluid is essential to calcium metabolism, but is associated with other factors necessary for life which are not yet fully determined.

P. W. B-S.

Faber (Harold K.). **A Study of the Anti-Scorbutic Value of Honey.** —*Jl. Biol. Chem.* 1920. Aug. Vol. 43. No. 1. pp. 113-116.

The fact that Dutcher (*Jl. Biol. Chem.*, 1918) had been able to show that honey contained a small amount of anti-neuritic vitamine, determined the author to carry out fresh experiments with the same substance. He used guinea pigs with a basal diet of oats and water. The honey fresh from the comb was given in solution ; the average quantity taken varied between 3·99 and 8·30 cc. per diem. In nine out of ten guinea pigs experimented on, severe scurvy developed in four to six weeks and he concludes that no anti-scorbutic vitamine was present in the honey.

P. W. B-S.

Harden (Arthur) & Robison (Robert). **The Anti-Scorbutic Properties of Concentrated Fruit Juices (Part iii).**—*Biochemical Jl.* 1920. Apr. Vol. 14. No. 2. pp. 171–177.

A dried preparation of orange juice evaporated at low temperature, when given to guinea pigs as a daily ration equivalent to 4·5 cc. of fresh juice had been found to give complete protection from scurvy [this *Bulletin*, Vol. 13, p. 362]. The remainder of the amount then made, after storage in a desiccator at room temperature for two years, when given in the same quantities to animals afforded equally good protection. Experiments were carried out to see if any loss of the anti-scorbutic factor had taken place in the preparation, as Chick and others have shown that 1·5 cc. of fresh juice protects a guinea pig. Quantities of 500–600 cc. were evaporated to a thick syrup at a temperature of 50° C ; this took about four hours, and it was then dried as in the previous experiments. Six animals were used. Two were satisfactorily protected over a period of 85 days with an equivalent of 1·5 cc. of fresh juice, two with 3 cc. and two with 4·5 cc., showing that there was no deterioration in anti-scorbutic power. Givens and McClugage using the " Merrell-Soule " patent process required 3 cc. ; in other processes the loss was even greater (76 per cent.). The author considers that by his method a successful commercial preparation of high potency is possible, particularly useful for children.

Further trials were made on a large scale by (A) Kestner Evaporator under 25 inches of vacuum and a steam pressure of 10–15 lbs., the fluid on leaving having a temperature of 60° C ; the resultant residual product was a viscid fluid. From the result of animal tests it appeared that by using this process a loss of 63 per cent. of anti-scorbutic properties had occurred.

(B) This fluid was further concentrated in vacuo, the temperature in the outer bath being raised to 80° C ; the final product was a toffee like solid containing 7·5 per cent. water, which still preserved a considerable anti-scorbutic power, an equivalent of 4·0 cc. giving protection.

P. W. B-S.

Harden (Arthur) & Zilva (Sylvester Solomon). **The Antiscorbutic Requirements of the Monkey.**—*Biochemical Jl.* 1920. Apr. Vol. 14. No. 2. pp. 131–134.

There is no doubt that the results of feeding experiments on monkeys are more conclusive than those of guinea pigs, but they present more practical difficulties especially in England ; both animals however give definite results, differing quantitatively with regard to dosage and time. Guinea pigs show well declared symptoms of the disease in 15–21 days, monkeys after two months. With regard to dosage an attempt was made to find the minimum of fresh orange juice necessary for monkeys, but it must be remembered that the condition of the fruit may in itself cause some variation.

Five animals were used, receiving 5 cc., 2 cc., 1 cc., 0·75 cc. and 0·5 cc. of fresh juice daily. The two first amounts protected the animals completely, but scurvy developed in all the others. The minimum necessary was between 1 and 2 cc. A monkey of 2–3 kilos is protected from scurvy by about the same quantity of orange juice as a guinea pig weighing 300–400 grms., but in the one the disease develops in about two months, in the other in about three weeks, suggesting that the monkey possesses a higher store of the anti-scorbutic factor than the guinea pig, while the daily requirements for metabolism are equal.

P. W. B-S.

UNDULANT FEVER.

A Case of Malta Fever.—*S. African Med. Rec.* 1920. May 22. Vol. 18. No. 10. pp. 190–192.

"This records the personal experience of a well known practitioner, and, for this reason he refrains from giving his name."

A medical man is proverbially a bad patient and relative values are apt to be distorted. In this present instance the subject persisted in "not giving in" while running a high temperature and secondarily there was a mixed tubercular infection. The description of the symptoms themselves is very graphic and the deductions made from them are useful; these bring back to the reviewer his own feelings during his illness, which was also a laboratory contracted infection: the never-to-be-forgotten insomnia or, as the author of the paper describes it, the lassitude in the day time, sleeplessness at night and, later on, the acute sciatic pains. To the urinary conditions and the diagnostic difficulties from prostatic trouble attention has not been previously drawn; they appear to be peculiar to South Africa. The continued presence of high agglutinins was no doubt partly due to the continuous use of sensitised vaccine which was begun early. The definite infection, with 14 days incubation, the long course (July 1914 October 1916), and a possible relapse in 1919, make the record of great interest and demonstrate what a trying disease this is to treat. In referring to the chronic form of the fever the author states that a number of Malta (undulant) fever patients give a positive Wassermann reaction and hence may be treated as syphilitics [but it must be remembered that the two may co-exist].

With regard to treatment he found, in other cases, that early administration of sensitised vaccine cured in about 8 weeks, but in chronic ones very prolonged treatment was necessary. Change to the seaside was helpful [this is not the reviewer's experience] and a restricted meat diet is best. The use of brandy in large doses for the general misery is a two edged sword as also is morphia for the pain.

[The constant use of the term "Malta" fever for the South African cases is unfortunately very common, though incorrect.]

P. W. Bassett-Smith.

Bernard (Léon) & Meunier (Henri). **Un cas de fièvre de Malte non méditerranéenne.**—*Bull. Acad. Méd.* 1919. Nov. 25. Vol. 82. No. 37. pp. 368–369.

The authors describe a case of undulant fever in a youth aged 15 who apparently contracted the fever at Luchon [Pyrenees] during the summer of 1918. The disease ran a long course lasting about ten months. The probable cause was cheese made from goats' milk. Enquiry led to the belief that though apparently the case was sporadic yet it is very likely that other undiagnosed cases had been present and the region should be considered as an endemic centre. Two

cases have been definitely reported, one from the department of Ariège and one from the Hautes Pyrénées.

[The evidence of infected goats in the herds is a question for further investigation ; they are well known to occur in Spain and have probably become disseminated.]

P. W. B-S.

Bassett-Smith (P. W.). **A Case of Undulant Fever with Unusual Nerve Sequelae.** -*Jl. Trop. Med. & Hyg.* 1920. Aug. 16. Vol. 23. No. 16. .p 201.

The record of a chronic infection which came under the author's observation at the Seamen's Hospital, Greenwich, during the fourth month of illness. At that time the blood serum agglutinated *M. melitensis* to a titre 1/2000. During a course of injections with a sensitized melitensis vaccine a vesicular eruption, accompanied by increased fever, appeared on the areas supplied by the fourth and fifth right lumbar nerves. Pain was moderate, reflexes were increased, and as the eruption dried some desquamation and loss of sensation occurred. Several abortive waves of fever, with slight neuritis, occurred later and a sharp attack, associated with acute right-sided orchitis, followed in the eighth month of the disease. This appears to be the first recorded case of herpes zoster complicating undulant fever. Subsequently the patient made good progress while under treatment with a freshly prepared non-sensitized melitensis vaccine. Cultures made from blood and urine were uniformly negative.

Once again Bassett-Smith draws attention to the fact that the blood picture of persistent melitensis toxaemia is one of secondary anaemia with low polynuclear and high lymphocyte counts.

This paper also gives the admissions to the Naval Hospital in Malta for undulant fever during the years 1914–1918 : total fifty seven ; of these six were French, eighteen Maltese, and thirty-three British ratings.

The first case of paramelitensis infection in the Naval service is recorded as having recently been admitted to the Seamen's Hospital.

W. Byam.

di Cristina (G.) & Maggiore (S.). **Osservazioni e ricerche sulla febbre mediterranea nei bambini.**—*Pediatria.* 1920. Jan. 1 & 15. Vol. 28. Nos. 1 & 2. pp. 1–22 ; 57–71.

In this excellent review of the etiology, epidemiology, and prophylaxis of undulant fever, the authors have put in evidence the work that has been done during the last few years, giving full credit to the different observers. Much of the record has already been reviewed in this *Bulletin* and in a short summary it is impossible to give it again in detail ; the work itself should be read by all interested. The following facts are, however, of special importance. Speaking of the disease in infants, it is stated that in 1917 there were 2,068 cases of fever treated in the hospitals in Palermo and of these 936 were ascribed to melitensis infections. This is attributed chiefly to the complete abandonment of all works of hygiene and measures against infective

diseases. Palermo has the sad privilege of being a city much troubled with the illnesses due to the want of preventive measures. Animals wander about freely and infect the streets with faeces and urine and thus disseminate the disease. Notification of cases, restriction of the goats, and destruction of infected ones are urgently required as prophylactic measures, together with personal hygienic measures.

The authors describe the clinical types found in infants as, hyperpyrexial, undulant, splenomegalic, dyscrasia, biliary, adynamic, rheumatic, nervous, and renal. The first is again sub-divided into typhoid-like, and septicaemic. The second is not very frequent, but sweats and an enlarged spleen are present; this type does not tend to be very severe. Third type is very common as reported by GABBI. In the fourth the cachexia is marked and rapid with dyspepsia, anaemia and atrophy and it is generally a severe form. In the fifth the organism is localised in the bile and with jaundice the prognosis is always grave. The sixth type is not uncommon; in severe cases the pulse is irregular, with cyanosis, irregular respiration, and sweats. The seventh type gives rise to great difficulty in diagnosis; when the neck muscles are affected there may be a condition like that of cerebrospinal meningitis; violent pains in the precordial region may simulate angina. The eighth type is very common in infants; the nervous system appears to be particularly affected by the toxin of the micrococcus giving rise to meningitis, encephalitis or even bulbar signs. In the meningitis there is much leucocytic proliferation; the meningo-encephalitis shows a preference for the Rolandic area and causes convulsions, spastic paralysis, etc. The bulbar forms are rare but very malignant. In the ninth type there is a direct toxic action on the kidney and uraemic symptoms or suppuration may be caused.

It is noted that true undulant fever in Italy may be associated with infantile kala azar, typhoid, dysentery, and tubercle; the conditions thus produced are fully described. Speaking of the pathological changes the authors state that little progress has been made. DE NUNNO has noticed degenerative changes in the nerve cells with leucocytic infiltration due possibly to the presence of endotoxins; in fact all the changes reported appear to be due to the acute or chronic toxic action of the infecting organism acting on the various structures and organs and producing the symptoms above noted. The importance of recognising the para-melitensis organism and the occurrence of non-specific agglutinins in the serum are emphasised as being of diagnostic importance. It is probable that there are various strains of the micrococcus as has been found to be the case with the meningococcus. Finally their views of serum therapy, vaccine and chemicotherapy are elaborated, but without any very definite conclusions being drawn though in many cases there have been very encouraging results. The serum of TRAMBUSTI and DONZELLO has undoubtedly been most efficacious in children. [A small slip has been made in writing Hennedy for KENNEDY when referring to his method of vaccine treatment.] As a whole vaccine treatment has been most successful; frequently cutting short the fever, with marked improvement of the symptoms local and general, and preventing relapses and in no case has it been known to give rise to any bad effects. It may be given subcutaneously, intramuscularly, or intravenously. The doses should

progressively increase, but it is wise in long cases to give these in series of 8–10 with an interval of 10–15 days before giving the second or third series. The efficacy of the vaccine therapy depends upon raising the defensive power, which can be shown by the opsonic index.

P. W. B-S.

Spampinato (Salvatore). **Alcuni casi di febbre mediterranea curati col vaccino antimelitense.**—*Policlinico.* Sez. Prat. 1919. Nov. 2. Vol. 26. No. 44. pp. 1299–1300.

The author deals with 82 cases of undulant fever, all of which were proved by serum reactions. In 8 cases an anti-melitensis serum obtained from the Institute at Milan was used; four injections were given in each case but no improvement was recorded. In another seventy-four cases he used a *melitensis* vaccine (Burroughs, Wellcome), each cc. containing 100 million *Micrococcus melitensis.* The first dose was rather less than one cc.; this generally produced a slight increase of the fever lasting about six days; the second dose of a full cubic centimetre or more was given on the tenth day. If the vaccine was used within the first month of the disease the fever disappeared entirely three days after the second injection.

In eight of the cases in which treatment was commenced in the second month, the pyrexia was variable lasting from eight to twenty days; it then ceased. The author states that he had no relapses, *but he does not state how long the patients were under observation.* A high temperature, 40° C (104° F.), contra-indicated the vaccine, but he used it even when the cases showed evidences of broncho-pneumonia or albuminuria, without ill effects. Spampinato concludes by saying that he has found this vaccine to bring about a rapid and real cure, but it should, if possible, be commenced early and a strict milk diet is unnecessary.

[The limitation of its use to cases in which the temperature was less than 40° C. would curtail its employment in very acute cases where there was much auto-intoxication and is in agreement with the experience of the reviewer.]

P. W. B-S.

Durán de Cottes (J.). **Tratamiento vacunoterápico de la fiebre de Malta.**—*Rev. Española de Med. Cirug.* Barcelona. 1919. Sept. Vol. 2. No. 15. pp. 495–501. With 2 charts in text.

The author states that he commenced in 1906 to treat cases of undulant fever by injections of the serum of immunised goats. Later he used serum taken from the patient himself or from another patient in an apyretic interval. Later again he combined chemo- with sero-therapy, giving, at the same time as a hypodermic injection of 10 cc. of serum, an intravenous injection of cyanide or perchloride of mercury. This combined method, while more efficacious than serum injections alone did not prevent the appearance of fresh febrile "waves" (*Ondas*). Vaccine therapy was therefore adopted in 1907. The first vaccines were prepared by killing the micrococcus by submitting it to a temperature of 56° C for half an hour. Later he used chloroform and later

again ether, instead of heat, for this purpose and found that, with chloroform or ether vaccine, reaction was less severe, while there was no loss of efficacy. This method was adopted in 1919 and is that still used by the author. He has had under treatment somewhat over 600 cases and sums up his conclusions from his experience as follows :—

1. Sero- and chemo-therapy find their appropriate sphere in the hyperpyretic forms and acute phases of undulant fever and prepare a favourable field for vaccine therapy.
2. Vaccine therapy is indicated in acute forms in the phase of falling temperature and in the apyretic interval, in doses inversely proportioned to the degree of pyrexia. In cases of moderate intensity and in ambulatory forms it may be used at any time.
3. Cardiac and renal lesions, of prior existence to the attack, are an absolute contra-indication in hyperpyretic and haemorrhagic cases. In mild and ambulatory cases with such lesions the vaccine must be administered with the utmost caution, avoiding reaction phenomena ; the treatment must be suspended on the least appearance of exacerbation.
4. Vaccine treatment, once successfully inaugurated, should be continued in cautiously increased doses. The dose should be diminished on the appearance of a fresh "wave" in proportion to its intensity, and the treatment resumed intensively directly the crest of the wave is passed.
5. Vaccine treatment diminishes the intensity of the attacks, retarding or suppressing them and definitely shortening the course of the illness.
6. Vaccine treatment is the most essential factor in the treatment of undulant fever. It should be continued till the patient is immunised. The earlier it is commenced in the course of the illness the better are the results.

[Intravenous injections of Mercuric chloride have been used by Scardo with success in goats but the combined serum and chemical treatment has never been reported before. P. W. B-S.]

F. S. Arnold.

Reynier, Petit (M. M. E.) & Louge (H.). **Deux observations de mélitococcie traités par le vaccine de Nicolle.**—*Marseille-Médical.* 1919. Nov. 1. pp. 998–1000. [Summarised in *Arch. Inst. Pasteur de Tunis.* 1920. Feb. Vol. 11. No. 3. pp. 179–180.]

Two sisters suffering from undulant fever were treated with a polyvalent melitensis vaccine containing 2,500,000 microbes per cc. One case improved rapidly and was cured after six injections ; in the other the treatment failed. It is pointed out that this was not a vaccine supplied from the Pasteur Institute at Tunis, but it is recognised that the results of vaccine and serum treatment for undulant fever are very uncertain ; much depends on the period of the febrile course when inoculations are given, the best time probably being at the end of a pyrexial wave.

P. W. B-S.

Finzi (Guido). **Sierodiagnosi e agglutinine nella setticemia di Bruce.**—*Pathologica.* 1919. June 15. Vol. 11. No. 254. pp. 259–261.

The author gives the conclusions reached in his research work, commenced in 1915, on agglutination in the serum diagnosis of undulant fever, using five strains of the *M. melitensis* from various sources.

(1) In two out of twelve healthy rabbits agglutinins to 1/50 were demonstrated; they were never found in serum of healthy goats or guinea pigs. (2) The serum of goats affected with tuberculosis and the serum of guinea pigs experimentally infected with tubercle never showed their presence. (3) In subjects affected by tuberculosis, in 24 hours after injection of tuberculin agglutinative properties were present for the *M. melitensis* up to 1/150. (4) Human serum from a subject suffering from trypanosomiasis showed no agglutinins. (5) The agglutinins found in healthy and tuberculised animals were destroyed by heating for half an hour at 55°–56° C showing their non-specific character. (6) The addition of complement (normal guinea pig's serum) did not give them in any case agglutinative power. (7) The serum of rabbits and guinea pigs treated experimentally with the micrococcus agglutinated this specifically in a dilution of 1/2,000. (8) This specific agglutination appeared 5–7 days after inoculation. (9) The serum of immunised rabbits tested with one or other of the five strains agglutinated best with the particular strain used for immunisation. (10) In the reaction obtained by the use of serum taken after tuberculisation the amount of agglutination was the same with all the five strains. (11) Agglutinins were found in the urine of two experimentally infected rabbits and that of a healthy rabbit up to 1/20; these were not considered to be specific. (12) The serum reaction for undulant fever has a very great practical value, but in all cases the serum must be heated to 55° C for half an hour to remove the non-specific agglutinins; when this is done, agglutination even at 1/10 must be considered positive. An anti-melitensis serum saturated by the strain used for immunisation loses its agglutinative power for such strain but keeps it still for other strains, showing different antigenic properties of the strains. (13) To avoid the danger in using the *M. melitensis* for agglutination, the recommendation of Ronchesi to use emulsions killed with formalin should be employed. These emulsions keep their agglutinability for a period of four to six months. From his research at Turin the author considers that in the serum of animals immunised against the micrococcus agglutination of two kinds is produced, due respectively to specific and accessory agglutinins.

P. W. B-S.

Tallo (Francesco). **Ricerche sperimentali sulla latenza del micrococco di Bruce nella bile.**—*Pathologica.* 1919. Sept. 15. Vol. 11. No. 260. pp. 401–404.

The author's experiments were carried out on rabbits and guinea pigs, using an emulsion of living *M. melitensis* grown for four days on agar. He found that after intravenous injection of the organism it disappeared from the blood between the 9th and the 12th day, but continued to be present in the bile in considerable quantities up to the 25th to the 38th day at least, and he concludes that in the gall bladder the organisms, protected from the bactericidal action of the serum, multiply and remain active. From this site they may again pass into the blood stream and give rise to the relapses which are so common in the disease. This chronic infection of the gall bladder is also a strong

actor in the production of "carriers," a fact which is of great importance with regard to prophylaxis.

[Eyre and others have previously recognised that the organism is found in the bile of the gall bladder, but it is generally understood that the chief means of dissemination is by infection of the urine and that these are the most common "carriers."]

P. W. B-S.

i. Meyer (K. F.) & Shaw (E. B.). **A Comparison of the Morphologic, Cultural and Biochemical Characteristics of *B. abortus* and *B. melitensis*. Studies on the Genus *Brucella* Nov. gen. i.**—*Jl. Infect. Dis.* 1920. Sept. Vol. 27. No. 3. pp. 173–184. With 2 plates.

ii. Feusier (M. L.) & Meyer (K. F.). **Principles in Serologic Grouping of *B. abortus* and *B. melitensis*. Correlation between Absorption and Agglutination Tests. Studies on the Genus *Brucella* Nov. gen. ii.**—*Ibid.* pp. 185–206.

i. The close relationship of the two organisms, which has been previously pointed out by Miss A. C. Evans [see this *Bulletin*, Vol. 12, p. 379], is fully recognised by the present authors, also that the organism known as *Micrococcus melitensis* is really a bacillus. For these two organisms they introduce the name "Brucella" as a new genus. 21 cultures of the so-called *Micrococcus melitensis* obtained from various laboratories in United States, England, Algiers, and Italy with 32 of *B. abortus* were studied, but no opportunity was present of examining the micrococcus direct from an actual case of undulant fever. It is stated that owing to the conservative attitude of many English bacteriologists the organism is still classed as a coccus and they fail to recognise that it may appear in smears from young cultures and tissues as a typical short rod. [With regard to these morphological characteristics it is well known that in strains long isolated and in certain media these irregular forms are common; the study of the plates supplied for observation by the authors show that in strains 1, 7, 18, and 26 definite cocci are quite abundant; those of 20 and 22 would give rise to some doubts as to the authenticity. If we turn to the report of the cultural characters the changes in colour to a deep chocolate, or dirty chestnut brown or even a dull ebony black within a month of the growth renders this morphological conception of the authors less likely to be taken as normal for the *M. melitensis*. The deep colouration also on potato media is not that experienced generally.] They conclude that the causative organism of undulant fever of man and of "Malta" fever of goats cannot be distinguished morphologically and biochemically from the organism causing infectious abortion in domestic animals; the so-called *M. melitensis* appears in young cultures as a short rod and should be called *Bacterium melitensis*. Pigmentation is more intense with the Melitensis strains than with the Abortus ones but the biochemical reactions of the two are similar.

ii. By the use of the same strains of so-called *Brucella abortus* and *melitensis*, a long series of absorption tests with type serums of the two organisms gave a definite grouping. Working with 14 strains, one of which was the type strain of Abortus, they fell into 4 groups.

Group 1 : Melitensis 20, Abortus 80 (all Abortus strains tested fell in this group).

Group 2 : Melitensis 18, 19, 21, 2, 6, 8, 11, 655, and 10.

Group 3 : Melitensis 7.

Group 4 : Para-Melitensis 22, para-melitensis 23.

In group 1 the organisms only varied in difference of titre. There was a wide difference beteen groups 1 and 3, and groups 1 and 4, but the relationship between 1 and 2 was very close, 2 appears to be a transition between 1 and 3 but is sharply differentiated from group 4. Group3 (a single strain) is taken as the type Melitensis from a serological point of view [and in the plate this one is shown as most abundantly coccoid]. Its agglutinins were found to be in a large measure specific, and it is clearly defined from the other types. Group 4, namely the para-melitensis strains, had low agglutinability and low antibody productive powers, and few agglutinins in common with groups 1 and 2 ; this is a highly specific group, most widely separated from the Abortus types.

A number of tables and diagrams are given supplying details of the work carried out, and this appears to have been very systematically done ; it therefore requires careful study. The close relationship of the organisms serologically is evident. The fact that the serum of cows and hogs suffering from natural abortion disease may react to both *B. abortus* and *melitensis* organisms is one of great practical importance, but it is doubtful whether the creation of the genus "Brucella" for these forms is justified and no type species is enumerated, which is essential in forming a new genus.

P. W. B-S.

DENGUE AND PAPPATACI FEVER.

Cleland (J. Burton) & Bradley (Burton). Clinical Notes by MacDonald (W.). **Further Experiments in the Etiology of Dengue Fever.**—*Jl. of Hyg.* 1919. Oct. Vol. 18. No. 3. pp. 217–254. With 9 charts.

In their previous communications [see this *Bulletin* Vol. 12, p. 76] the authors gave the results of their experiments in which they dealt with the position, viability, filtrability, and infectivity of the virus of dengue fever in Australia; and showed that it could be conveyed to at least four generations of artificially infected cases. In the present paper further experiments on the same lines have been carried out. In the filtration of the fluid containing both the virus and emulsion of S.P.A. through Pasteur and Chamberland F-filters, in the light of the very irregular temperature charts shown, it is not conclusive that the condition produced was due to the virus and not to filtered toxin.

A survey of these charts of cases shows great irregularity, and a noticeable increase in similarity to ordinary dengue in those in which the whole blood was used. The results appear to show that the virus may be present in the blood from eighteen hours after the onset to ninety hours, but was not found at one hundred and eighty hours. The same great variability was found in the incubation period, four and a half days to fifteen days.

An immunity to a fresh infection by inoculation was found two hundred and twenty days after the onset of a previous attack of dengue. A single experiment to convey the virus by *Culex fatigans* failed, and the virus was not pathogenic to guinea pigs or rabbits.

The description of the experiments is interesting. In an appendix the cases are reported with details and in nine the temperature charts are given. The infectivity of the blood is fully proved and the authors' early experiments showed that *Stegomyia* (*calopus*) *fasciata* is the usual intermediate host in Australia.

P. W. Bassett-Smith.

Levy (Moise D.). **Dengue: Observations on a Recent Epidemic.**—*Med. Record.* 1920. June 19. Vol. 97. No. 25. pp. 1040–1042.

The author reports a widespread epidemic of dengue fever at Galveston in August-November 1918. The number of cases was estimated to be between 4,000 and 6,000; approximately one out of every six of the population was affected. Epidemics have occurred at irregular intervals but it is possible that mild cases may have been constantly present; the rather significant fact is noted that a short while before the epidemic appeared a number of Marines had arrived at Galveston from the West Indies where dengue is known to be endemic. The symptoms were fairly distinct, though very great variations in intensity were noticed. The saddle back type of fever curve was common; joint complications were almost absent, but eyeball pain was severe; glandular enlargements, slow pulse and an eruption, from a well marked morbilliform to an almost imperceptible erythema,

were fairly frequent. The author noted that besides the generally recognised leucopenia, a well marked reduction in number of the red cells could generally be demonstrated, which may account for the marked lassitude and debility following the fever. Relapses three to six weeks after the primary attack were recorded. Both *Culex fatigans* and *Stegomyia calopus* are present in Galveston in abundance during the summer months. As there were no deaths no pathological evidences were obtainable.

P. W. B-S.

Taylor (C. R.). **Sand-Fly Fever in Mesopotamia** (Correspondence). *Brit. Med. Jl.* 1920. May 1. p. 620.

The statement made by Willcox in his paper on heat hyperpyrexia in Mesopotamia that "during August 1917 when heat stroke was most frequent sandfly fever was entirely absent" was not in accordance with the experience of the author, for sandfly fever raged in Basra throughout the summer of 1917 and in that disease the temperature often ran up as high as 105°. At Baghdad sandflies were reported to have been less troublesome than at Basra.

P. W. B-S.

JAPANESE RIVER FEVER.

Hatori (Juro). **On the Endemic Tsutsugamushi Disease of Formosa.** —*Ann. Trop. Med. & Parasit.* 1919. Dec. Vol. 13. No. 3 pp. 233–254. With 1 map, 1 chart, & 2 plates.

Since 1904 an endemic exanthematous fever has been recognised in Eastern Formosa known as " Batran " fever and has appeared in widely distant areas. The author in 1914, and since, from personal observations determined that the fever, which was always associated with swelling of lymphatic glands, was analogous to the Tsutsugamushi or Kedani disease of Japan. He describes its symptomatology and epidemiology. His aetiological researches show that the virus is transmitted by the bite of the mite *Trombicula akamushi* which infects common rodents, insectivora, and other wild and domestic animals (chickens, pheasants and dogs). The fever appears in Formosa from April to November and the endemic areas are situated in river valleys or fertile plains and woodlands either at the foot of the mountains or on elevations free from inundation (the Japanese fever is strictly restricted to certain parts of river banks, etc., which are subject to annual inundations). It is noted also that the presence of an exanthem is less frequent and the mortality is less in the Formosa cases. The author did not find the Japanese monkey susceptible to the virus though some of the indigenous monkeys became infected. The pseudotyphus of Sumatra, Australian Mossman fever and exanthematous glandular fevers described from the Philippines, Saigon and the Malay States have many features in common and are most probably caused by the bites of mites [see this *Bulletin*, Vol. 5, p. 360 ; Vol. 6, pp. 314, 316]. The prophylactic measures recommended are similar to those used in Japan. There are two good plates showing the mites, a river valley and the appearance of the bites produced by the mites.

P. W. Bassett-Smith.

Hatori (J.). [**" Tsutsugamushi " Disease in Formosa (5th Communication).**]—*Taiwan Igakkai Zasshi. (Jl. of Formosa Med. Soc.).* 1920. Mar. 28. No. 209. pp. 317–352.

The first part of the report consists of descriptions of the cases found in Kwarenkô and Giram Prefectures, while the latter part consists of the geographical account of the disease and some zoological notes on the mites. New cases of the disease are made known in Tôyen and Tainan Prefectures, so that there are now left only three Prefectures, i.e., Taichû, Nantô and Taitô, where no definitely proved case has ever been recorded.

The author proves by rearing it that an undeterminable mite which he once described (same journal, No. 181, 1917) is referable to his *Trombicula pseudoakamushi.* The larva cannot be fed on blood of man, monkey and mouse, but is found parasitic on a species of Cuculid birds, *Centropus javanicus.* The nymph reared artificially from this larva is described. *T. pseudoakamushi* is very closely allied to *T. mediocris* but is distinct, and has hitherto been recorded in Kwarenkô,

Giran and Tôyen Prefectures. Further, two new avian mites are described: *Trombicula* (?) *gallinarum*, sp. n.: the larva only is known, it is characterized by its fan-shaped sensory hairs, and is found parasitic chiefly on chicks, but also on *Caprimulgus monticola* and *Corvus macrorhynchus*. The affected spot on the host can easily be made out as a swelling with crater-shaped pit at the centre. *T. corvi*, sp. n.: also larva, differs from the former in the simple hairs, while the larger size of body, the longer tarsus of the anterior pair of appendages, and more numerous hairs make it distinct from *T. akamushi*. It was found on a crow, *Corvus macrorhynchus*. In the districts where the disease is known to occur, *T. akamushi* has been lately found in *Mus jerdoni*, besides in *M. rattus rufescens*, *M. decumanus* and *M. agrarius*. *Crocidura muschata* has been known as a host, while *Sorex dzinezumi* is to be added as another host among Insectivora. Dogs and cats in those districts are often found attacked, and the buffalo, *Bubalis bubalus*, also carries this mite. Among birds the mite was found on *Phasianus formosanus* and *Turnix taigoon* besides on domestic fowls (chicks).

Hiroshi Ohshima.

Kawamura (R.), Fukube (T.), Olmori (S.), & Yamakuchi (S.). [**Etiology of Tsutsugamushi Disease.**]—*Tokyo Iji Shinji* (*Tokyo Med. News*). 1917. Nov. 10. No. 2094. pp. 2327–2334. [From Review by R. G. Mills.]

The authors were unable to demonstrate any organisms in the tissues either by culture or by histological examination.

The blood of two patients in the early stages who showed only lymph gland enlargement caused infection in monkeys, as did that of one case two days before defervescence, while the blood obtained 22 days after defervescence did not infect. The test infecting dose for monkeys was 0·1 cc. though 0·001 cc. may infect. Monkeys were also infected by emulsions of enlarged lymph glands.

Attempts to determine whether the virus is present in the blood plasma (citrated blood) or in the corpuscles were not conclusive. Plasma injections were positive in 1 out of 8 trials; injections of washed corpuscles were negative in seven trials; however positive results were obtained with the unwashed sediment from citrated blood. Negative results were obtained with one specimen of serum and with four specimens of plasma after dilution and Berkefeld infiltration (V).

The ascitic fluid obtained by intraperitoneal injection of salt solution into infected monkeys was centrifuged, and the sediment, consisting largely of leucocytes, caused infection in both of two monkeys inoculated, while the clear fluid gave positive results in one out of two cases. Attempts to separate leucocytes from red corpuscles in citrated blood were not successful. From these results it is concluded that the virus is probably in close relation with the leucocytes.

Negative results were obtained with blister fluid, cerebro-spinal fluid, urine, and with blood from the umbilical cord of a foetus from a mother monkey on the twelfth day.

The virus in the blood of an infected monkey was destroyed in ten minutes at 55° C., and after 15 minutes at 45° C. It was also destroyed after one week in the incubator and after ten days at 2° C.

It did not resist desiccation. It was destroyed by 9·5 per cent. Mercuric chloride solution, by 9·5 per cent. Carbolic acid and by 1·0 per cent. Potassium hydroxide.

The spleen of a patient 6 hours after death was not infectious ; this indicates rapid disappearance of the virus from the tissues after death.

The author believes that a slight degree of immunity develops and lasts for two or three years. Second attacks occur but are usually mild.

Blood serum from a recovered patient or an " immune " monkey did not destroy the virus in infected blood.

The spleen and blood of a rabbit which had been exposed to natural infection in an infested region, killed 14 days later, infected monkeys, although the rabbit showed no symptoms of infection.

The spleens of field mice caught in an infested region also regularly caused infection, although a red mite was found on only one mouse.

Injections of monkeys with emulsions of red mites were negative but this may have been because the mites used were not infected.

Salvarsan, quinine, and injections of convalescents' serum (in small doses) had no effect on the course of the disease in severe cases.

P. W. B-S.

OROYA FEVER.

Valdizan (Hermilio). **El delirio en la enfermedad de Carrión.** [The Delirium of Carrion's Disease.]—*Crónica Méd.* Lima. 1919. Aug. Vol. 36. No. 674. pp. 263–273.

A description of the type of delirium observed in cases of Oroya fever known in Peru as Carrion's disease. The description is based in the main on 3 cases, that of Carrion himself and those of 2 patients under the author's observation. The delirium has been described as a dream or nightmare with eyes open. There is as a rule no great motor excitability but visual and tactile hallucinations are a marked feature. Delirium frequently comes on in the apyretic intervals of the disease, appearing often as a sign of exhaustion after crises of hyperpyrexia or, in the later stages of the malignant form of the disease, when the characteristic anaemia is far advanced.

F. S. Arnold.

ROCKY MOUNTAIN FEVER.

WOLBACH (S. Burt). **Studies on Rocky Mountain Spotted Fever.**—*Jl. Med. Res.* 1919. Nov. Vol. 41. No. 1. (Whole No. 177). pp. 1–197. With 21 plates, 4 maps & 10 charts in text.

In this monograph the author has recorded practically all that is known about Rocky Mountain spotted fever, the aetiology of which he has done so much to elucidate. The disease is well known ; its transmission by means of ticks, suggested by WILSON and CHOWNING in 1902, was fully demonstrated in 1906 by RICKETTS. The gradually increasing geographical distribution and serious loss which it entailed on the people of the infected areas made it necessary for a thorough investigation as to its cause and prevention. This was taken up by the United States Public Health Service and independent workers between 1905 and 1919. The disease probably existed in the Bitter Root Valley at least seventy five years ago, but the areas chiefly affected are found in Montana, Idaho, Wyoming and Utah ; these as shown in the maps are the parts most infested by the wood tick *Dermacentor venustus*. It is a curious fact, however, that the disease varies greatly in virulence in different areas ; in Idaho it is more chronic and much less fatal than in Montana ; no definite explanation for this is yet forthcoming but the author gives reasons for the belief that it is due to altered virulence by passage in naturally infected rabbits found in the infected regions. The mortality varies from 75 per cent. in the Bitter Root Valley to an average of 7 to 13 per cent. The author defines the disease as " an acute specific infectious endangeitis, chiefly of the peripheral blood vessels, transmitted by a tick, *Dermacentor venustus*, and characterised by onset with chill, continued fever, severe pains in bones and muscles, headache and a macular eruption becoming petechial, which appears first on wrists, ankles and back, then over the whole surface of the body." March to June are the months of greatest prevalence and this corresponds with the period of greatest activity of the ticks. The incubative period lies between three and twelve days ; the onset generally occurring between the fourth and eighth day after the feeding of the tick. One attack gives complete immunity in man.

The greater part of the paper deals with the aetiology and the pathology. WILSON and CHOWNING found an intracorpuscular parasite which they called *Piroplasma hominis* ; this was disproved by STILES and others. RICKETTS described a bacterial-like organism and obtained repeated passage of the virus through generations of ticks and transmission by them to man.

The author took up the work and by ticks and animal experiments has demonstrated the infective organism and the pathological lesions it produces. Three definite morphological types of the parasite can be recognised : (1) An extra-nuclear bacillus-like form without chromatoid granules, relatively large and only present in ticks during the initial multiplication of the parasites ; (2) A relatively small rod-shaped form with chromatoid granules, probably the same form seen within the nuclei in sections of ticks and rarely in the smooth muscle cells in blood vessels of mammals ; and (3) A relatively large lanceolate paired form present in ticks and in the blood and

lesions in mammals. The lanceolate form is characterised by its chromatoid staining reaction and is probably the form in which the virus is passed between the tick and the mammalian hosts.

This micro-organism is constant in its occurrence in the characteristic lesions of man, monkey, rabbit and guinea pig. It is constantly present in ticks of proved infectivity and absent in proved non-infective ticks. The micro-organism can be recognised in the tissues and eggs of infective ticks in the presence of other occasional bacteria. It has so far not been cultivated. The author places it in an intermediate position between bacteria and protozoa and proposes the name of *Dermacentroxenus rickettsi* for the parasite ; it is probably closely allied to the Rickettsia bodies found in lice. Typhus and Tsutsugamushi disease have clinically a strong resemblance to Rocky Mountain spotted fever and may (according to the author) eventually be classified in the same group, and also possibly trench fever, in which similar Rickettsia bodies have been described by Arkwright, Bacot and Duncan.

The whole work will repay careful study by all interested in the subject but it is impossible in a short article to do full justice to the many facts detailed. The plates, both coloured and photographic, are excellent and the bibliographic record is very complete.

P. W. Bassett-Smith.

UNCLASSED FEVERS.

Charpentier (P. J. L.). **Fievre épidémique observée à bord de la Décidée dans la vallée du Yang-Tsé-Kiang.**—*Arch. Méd. et Pharm. Nav.* 1919. Nov. Vol. 108. No. 5. pp. 351–374.

In June of 1914 the French Warship "Decidée" was stationed for the summer near Tchang Cha in the valley of the Yang Tse. The author describes the geographical, climatic and dietetic conditions very fully. These were of the most unsatisfactory nature; the ship was surrounded by mud swamps, the heat was excessive day and night and the food was poor. This necessarily led to deterioration in the health of the crew. In July an epidemic appeared on board attacking all except the Commandant and the Surgeon (total 120).

After a short prodromal period there was high fever, congestion of face, headache, somnolence or coma, relatively slow pulse for the fever, and occasional pulmonary symptoms; the fever lasted three to seven days and was followed by great anaemia, asthenia and anorexia. Three types are described, (1) hyperpyrexial, (2) severe, (3) slight. There were only two deaths, both cases being sent to Hankow Hospital.

The author states that for want of a microscope, he was unable to study the etiology of the disease, but he gives a very interesting account of the epidemiological conditions, the constant heat being certainly a predisposing factor. Large brown flies were common by day and mosquitoes by night, but he favours the probability of the infection being derived from the muddy water. The diagnosis was difficult.

It was recognised early that the epidemic was different from any described in text books. It resembled the condition known as siriasis in many features, but differed in the low mortality and low pulse rate and rareness of pulmonary complications. It was not malarial (in that it was not cured by quinine) and was not intermittent, it was not dengue or schistosomiasis, and there were no symptoms of an intestinal bacterial infection; it was probably one of the group of local fevers of unknown origin known as Yang Tse, Ichang or Shanghai fevers.

[The absence of efficient medical equipment for the study of such diseases in naval ships likely to be stationed in malarial and unhealthy climates is a grave administrative error. A pyocyaneous septicaemia has lately been found to exist in Shanghai fever, see this *Bulletin*, Vol. 13, p. 347 (Dold.).]

P. W. Bassett-Smith.

Bernard (P. Noel). **Sur une fièvre de cause inconnue observée en Cochinchine (Note préliminaire).**—*Bull. Soc. Path. Exot.* 1920. Feb. 11. Vol. 13. No. 2. pp. 104–107.

In a study of the so-called "climatic fevers" of unknown origin, and described as pseudo-dengue, seven day fever, five day fever and by local names, the author has made in the period between June and December 1919, at the Pasteur Institute, Saigon, 212 blood culture examinations. He found *B. typhosus* 19 times in natives and 4 times in Europeans, and isolated a Gram-positive, spore bearing, aerobic, large bacillus 92 times (in 61 natives and 31 Europeans). This organism liquefied gelatine, haemolysed red blood cells, gave acid

reaction but no gas with maltose, saccharose, and glucose, but had no action on lactose and mannite. From two fatal cases the same organism was isolated post mortem in the spleen, liver, kidneys and brain. It produced antibodies in the blood, agglutinins and complemental fixation bodies. Inoculated into rats it gave rise to a bloody gelatinous oedema and a rapid general septicaemia, the organism being recovered from the organs as in man.

Though the bacillus appears to be specific, the author does not claim that all the above mentioned clinical fevers are identical, further observations being required to determine which is the clinical resultant of this specific organism, and for the present suggests the name "*Fièvre asthéno-myalgique*" which indicates the three chief characteristics. The epidemics are often very extensive; they are most common in the summer months but cases occur all the year round, the intensity of the symptoms varying from time to time.

P. W. B-S.

DE LANGEN (C. D.). **Enkele opmerkingen betreffende "Low Fever."** [Notes on Low Fever.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1919. Vol. 59. No. 5. pp. 701–711.

In the author's opinion the diagnosis "low fever" is about as much or as little of a diagnosis as "headache" and he maintains that the disease "low fever" will in time disappear from text-books, tubercle, malaria, lues, etc., each, with more exact diagnosis, claiming a portion of the group, while the remainder will probably prove to consist of persons who are endeavouring, by means of heightened combustion to eliminate an excess of blood-sugar, due to an over-sensitive sympathetic system or to some other cause. The slightly raised mean temperature and the heightened sugar metabolism, found in so many persons in the tropics, are, in the author's opinion, causally connected. It is quite common for dwellers in the tropics to have a persisting daily maximal temperature of 100° F. without any feeling of illness or any necessity for treatment. Should a person in this condition have his attention drawn to the fact that his temperature is above normal, he will often begin to feel ill and develop a clinical picture very like that of genuine low fever. If the physician succeeds in breaking down this auto-suggestion his patient is "cured" and remains so, though his temperature keeps at its heightened level, so long as he leaves his thermometer alone. The author is strongly averse to the use of quinine in the treatment of low fever cases. Regarding excess of blood sugar as the underlying factor and a hyper-sensitive sympathetic system as underlying this again, he gives calcium salts which, as is known, lessen the irritability of the sympathetic.

F. S. Arnold.

FRY (A. Sargood). **Typhus and Typhus-Like Fevers in Birjand, East Persia.**—*Indian Med. Gaz.* 1920. Feb. Vol. 55. No. 2. pp. 47–50. With 10 charts.

The author describes nine cases of typhus and one doubtful case, which were under his treatment at Birjand in 1919 between the end of April and August.

The mortality was 20 per cent. and the average duration of incapacity from duty was two months. Both natives and Europeans were affected. Pulmonary symptoms were generally present and in one a dysenteric condition was superadded. The rash in no case was petechial. The fever generally showed a primary and secondary wave. No information is given of epidemiology of the outbreak but it is stated that the disease is not uncommon in Eastern Persia.

P. W. B-S.

Bonne (C.). **Over een tot nog toe niet beschreven dengueachtigen koortsvorm in Suriname.** [A Hitherto Undescribed Dengue-Like Fever in Surinam.]—*Geneesk. Tijdschr. v. Nederl-Indië.* 1919. Vol. 59. No. 1. pp. 13–64. With 8 charts.

——. **Nog enkele opmerkingen over de dengueachtige ziekte van Suriname.** [Further Observations on the Dengue-Like Sickness of Surinam.]—*Ibid.* pp. 65–67. With 2 charts.

The author describes a febrile illness endemic in Dutch Guiana which he maintains is frequently wrongly diagnosed as influenza, measles, typhoid, catarrhal fever, fourth disease and so on. The disease, he states, has many affinities with 5 day or Van Der Scheer's fever, with the 6 day fever of the Panama Canal zone, and with the 7 day fever of Rogers. The adult native population is relatively immune. Europeans, Americans and Javanese recently arrived in Surinam are the principal sufferers but young native children are not immune and the disease follows in them a typical course.

Data concerning natives of British India, Chinese and African negroes are at present scanty. Little can be said about the incubation period. It may, however, be less than 9 days. The fever lasts generally 5–7 days and ends by crisis. The onset is sudden.

Exceptionally the fever ends by lysis and lasts about a fortnight. During the course of the fever there is a remission or intermission which may be anything from a barely noticeable fall of temperature to several days of complete apyrexia, sometimes even of subnormal temperature. Occasionally the second rise of temperature is absent and the curve then resembles that of "three day fever." Many patients exhibit a terminal polymorphous exanthem which may resemble measles, scarlet fever, or urticaria. There is often itching but desquamation has not been noticed. It affects chiefly the chest and the extensor surface of the forearm, but may spread over the whole body. More rarely there is an initial exanthem. An initial redness of the face is fairly frequent, with conjunctivitis, photophobia and lachrymation. There is occasionally swelling of the face and eyelids. Patients frequently, but by no means always, complain of pains, especially in the head, back, chest and joints. With the exception of the headache these pains are seldom severe. Splenic enlargement, albuminuria, jaundice, and pulmonary and intestinal complications are absent. The tongue is generally thickly furred with loss of appetite and, occasionally, vomiting. Herpes has been observed but never in uncomplicated cases. Examination of the blood shews leucopenia, most marked towards the end of the fever. The diminution affects all leucocytes except large mononuclears and transition forms.

Lymphocytosis is most marked during the first days of convalescence (up to 73 per cent.). There is neutropenia and diminution of eosinophiles and basophiles. All the cases observed by the author recovered. He states that in many cases a diagnosis is impossible without an examination of the blood.

In the author's "further observations" he gives histories of two second attacks of the disease.

F. S. A.

Imi (S.). [**A Clinical and Bacteriological Study of Pseudo-Typhus Exanthematicus.**] *Nippon Biseibutsugakkai Zasshi.—(Jl. of the Japan Protozoological Society).* 1918. Jan. 1. Vol. 6. No. 1–6. pp. 527–575.

[From Review by R. G. Mills.]

Between August 1917 and January 1918 the author examined 20 cases of this disease in South Manchuria and North Korea. The clinical symptoms closely resembled those of true typhus. The onset was usually abrupt, with a chill, high fever, headache, vertigo, mental dulness and general pains especially affecting the back, with anorexia, nausea, vomiting or constipation. There was often reddening of the face, conjunctiva and pharynx, and swelling of the tonsils. The temperature rose abruptly with the chill to 40° C, and continued high for from 9–14 days when it usually fell by crisis, though in some cases a remittent or intermittent type of fever persisted for a long period. The pulse was usually rapid in proportion to the fever.

An exanthem appeared after $2\frac{1}{2}$ to $4\frac{1}{2}$ days, first on the chest and abdomen, then on the back, arms, legs and neck, occasionally on the face, palms, and soles. It consisted of macules, round, discrete, from a half to one and a half cm. in diameter, at first rose coloured and fading on pressure, later haemorrhagic. The rash disappeared after one to two weeks.

The serum of these patients gave negative agglutination reactions with *B. typhosus*, and *B. paratyphosus* A and B. Cultures from the stools and urine were negative. From the blood the author obtained positive results by placing 2 cc. of blood in bile, and after incubation subculturing on Endo plates. The organism obtained he called *B. pseudo-typhus exanthematicus.*

Its cultural characteristics were:—Morphology.—A short bacillus with rounded ends 1–2·5 micra long, and 0·6 to 0·8 broad. No capsules, no spores. From 1–12 cilia were present, more than ten times the length of the bacillus.

Motility.—Active.

Viability.—A broth culture was killed in 30 minutes at 56° C. A thin film on a glass slide was killed by exposure to direct sunlight for two to three hours, but was alive after two weeks when kept in the dark. It stained readily and was decolourised by Gram.

Cultural reactions.—Milk was coagulated after 120 hours (*B. coli* caused coagulation in 48 hours, *B. typhosus* and *paratyphosus* A and B no coagulation.) Litmus milk was slightly reddened after 17 hours, distinctly red after 120 hours. Endo Medium.—Colonies discrete, round, slightly pink, not as deeply coloured as *B. coli.*

The serum from all these patients agglutinated the homologous bacillus; the titre varied with the stage at which the serum was

obtained. Control tests with *B. typhosus* and *B. paratyphosus* A and B were negative except for one serum which agglutinated *B. paratyphosus* A in a dilution of 1–50. Immune sera were obtained from rabbits with two of the strains. Both sera agglutinated in high dilution the three strains of this organism with which they were tested, and neither agglutinated *B. typhosus*, or *B. paratyphosus* A or B, *B. metatyphosus* (Ishihara), *B. enteriditis*, nor *B. typhimurium*. These strains were not agglutinated by a typhoid nor a para-typhoid A or B immune serum. The pseudo-typhus immune sera stimulated phagocytosis of the homologous strains, and gave positive complement fixation reactions with them, while negative results were obtained with the other organisms tested. He concludes that the disease was a distinct etiological entity, and calls it pseudo-typhus exanthematicus.

[Tsutsugamushi fever and a peculiar form found in Sumatra and the Malay States have been frequently called pseudo-typhus. The rash may not be very evident and the initial site of inoculation not seen. It is possible that the bacillus isolated may have been a secondary infection.]

P. W. B-S.

von Teubern (F.). **Eine quartana-ähnliche Fiebererkrankung, durch Neo-salvarsan geheilt.** [A Quartan-Like Fever treated with Neo-Salvarsan.]—*Deut. Med. Woch.* 1920. Aug. 26. Vol. 46. No. 35. pp. 964–965. With 1 curve in text.

The author describes a case of pyrexia with irregular quartan attacks of fever which was contracted by a working woman aged 55, living in the outskirts of Berlin. She was treated at first with quinine, which apparently did no good, and then given eight doses of neo-salvarsan, commencing with 0·15 gm. One pyrexial attack followed the first injection and was not succeeded by others. The woman rapidly gained weight and health. The difficulty of diagnosis was to differentiate this fever from quartan malaria, which was chiefly done by the absence of any evidence of parasites in the blood.

P. W. B-S.

Broughton-Alcock (W.). **Sixteen Cases of Infection with *Bacillus aertrycke*. Clinical and Laboratory Observations. A Note on the Relationship of *B. aertrycke* and *B. para-typhosus* B.**—*Jl. Roy. Army Med. Corps.* 1920. Oct. Vol. 35. No. 4. pp. 317–327.

The sixteen cases were all V.A.D. nurses on passage from England to Malta. Only one-third of the total nurses were attacked. They had not been on shore for fourteen days previous to the onset of symptoms, which were those of gastro-enteritis of a mild character in all but one case. It was impossible to determine the source of the infection. *B. aertrycke* was isolated from the faeces in two cases but not from the blood; this organism was lethal to guinea pigs, when given intraperitoneally, in fifteen to twenty-four hours and was again recovered from the animals. A long series of agglutination and absorption tests was made and the results are tabulated. All the nurses had been inoculated with T.A.B. vaccine, agglutinins were present in the blood for Para. B. two days after the first symptoms, but those for *B. aertrycke*

did not appear until after the sixth day and were present in all cases on the ninth, persisting in fourteen out of the sixteen cases for one month, then slowly falling.

B. enteritidis Gaertner was not agglutinated by any of the patients' blood sera at any time. [*B. aertrycke* has been shown by Schütze to be divided into 8 types, the most common of which is the Mutton type (*B. suipestifer*).]

P. W. B-S.

Tsen (Edgar T. H.). **Bacillus Pyocyaneus Infection: Report of Case.** *China Med. Jl.* 1920. July. Vol. 34. No. 4. pp. 389–391.

In the Pekin Union Medical College Hospital a patient aged 36 presented febrile symptoms and tubercular signs. At the autopsy pulmonary tuberculosis was demonstrated. Eight days before death *B. pyocyaneus* was found and cultured from the cerebro-spinal fluid; four days before death the same organism was obtained from the blood and it was again found in the heart blood after death. The serum of the patient agglutinated this homologous strain up to a titre of 1 in 640.

P. W. B-S.

Sewell (R. B. Seymour). **Notes on Certain Cases of Fever.**—*Indian Med. Gaz.* 1920. July. Vol. 55. No. 7. pp. 244–247. With 8 charts.

After leaving the Aden district where the men of the regiment suffered severely from malaria a move was made to the canal zone and in February and March they were employed in the desert some six miles from the canal. An epidemic of a short fever occurred having the characters of the so-called "Mediterranean dengue" but the author, who examined a number of blood films and made relative white counts, found a great variation in the proportion of polymorphonuclear cells, from 53 to 88 per cent. He describes also as being present in four cases numerous cocci, diplococci and short chains found in the pyrexial periods, which he thinks may be etiological factors of a new disease. The interesting fact is noted that while in the desert camp water was scarce and *Peliculus vestimenti* were abundant, bearing some relation to the incidence of the fever. Mosquitoes and sandflies were rarely found except in the canal zone. The pediculi were eradicated and there were no cases of this fever, but when again the desert camp was occupied a single typical case of the fever occurred.

P. W. B-S.

Wallis (Herbert). **Pyrexia not yet Diagnosed, of Dental Origin.**—*Jl. Roy. Army Med. Corps.* 1920. Apr. Vol. 34. No. 4. pp. 360–362.

The importance of septic conditions of the teeth and gums as a cause of irregular pyrexial attacks in the tropics is emphasised and a number of cases are described with the appropriate treatment to be used.

P. W. B-S.

PLAGUE.

WILLIAMS (C. L.). **The Diagnosis of Human Plague.**—*Jl. Amer. Med. Assoc.* 1920. Aug. 7. Vol. 75. No. 6. pp. 370–371.

This is a useful paper and for those who are unable to read it in full the following extracts are given :—

"Plague occurs in four forms . . . bubonic, pestis minor, septicaemic and pneumonic. Of these, bubonic is far and away the most important to us, since it is the type that is most likely to occur in this country. . . .

"*Bubonic Plague.* There are three principal symptoms of this type of plague, and one clinical sign . . . . The symptoms are sudden onset, rise of temperature and marked prostration. The sign is the bubo . . . At onset frequently appears mental haziness and disordered motor co-ordination . . . A chill is quite common. The temperature varies from 100° to 106° F. with 102° as the average . . . . Minor symptoms are full but rapid and compressible pulse, injected conjunctiva and flushed skin . . . . The bubo, nine times out of ten, is femoral and virtually always on one side only. Occasionally axillary buboes occur, due to infection through flea bites on the hand or forearm, and very rarely the glands of the neck are the ones affected. Since . . . . the rat-flea usually bites man on the lower portion of the leg, we find that Scarpa's triangle on one leg or the other is the site of election . . .

"The bubo has four main characteristics : It appears coincidentally (approximately) with the onset of the disease ; . . . the skin immediately over the bubo is hot and red ; and the mass is exceedingly tender and painful to the touch. The bubo is an entity : not a string of enlarged glands, but a mass of . . . . engorged necrotic glands embedded in gelatinous inflammatory tissue. It . . . . does not suppurate until a week or two after the onset, if at all. Unlike venereal buboes, it shows a broad, flat surface, seldom coming to a point. . . . Minor signs are palpable spleen, large liver and occasionally the presence of a blister or "phlyctenule" on the extremity carrying the bubo. . . . The last . . . should always be searched for because . . . . smears from the contents revealing the typical *B. pestis* in tremendous numbers. . . . .

"*Pestis minor.*—Pestis minor is the mild form of bubonic plague. . . .

"*Septicaemic Plague.* . . . there is an overwhelming infection of the blood, with death in three or four days, without the appearance of buboes . . . . its diagnosis without previous knowledge of the existence of plague in the community is hardly to be expected.

"*Pneumonic Plague.*—In pneumonic plague, we have a relatively rare form of the disease which, however, being directly contagious, is highly apt to become epidemic. . . . It is unlikely to occur in the Southern cities, but from San Francisco and Norfolk on the two coasts North it must be borne in mind as a possible menace. . . .

"Plague pneumonia differs from other forms of pneumonia on three points : after sudden onset, the patient is extremely prostrated with almost no chest signs ; by the time definite involvement of the lungs is demonstrable, the patient dies. The sputum is watery, never thick and tenacious, and soon becomes very bloody. . ."

[Cf. LEE, this *Bulletin*, Vol. 15, p. 63, see also JACKSON, Vol. 9, p. 500.]

J. H. Tull Walsh.

Joltrain (E.). **Valeur de la réaction de fixation de Bordet dans le diagnostic de la peste.**—*C.R. Acad. Sci.* 1920. Aug. 17. Vol. 171. No. 7. pp. 413–414.

The author first remarks that bacteriological and sero-diagnosis is often difficult in cases of plague septicaemia, before the bubo appears. His experiments were carried out with serums from patients attacked by plague or considered suspect :

" The reaction of fixation was shown to be positive in several cases which had been confirmed bacteriologically. In three cases not clinically certain, the reaction of fixation was positive. Agglutination in these three cases was equally positive : 1:20 to 1:70 and to 1:150, titres which are high for plague. In four clinically doubtful cases in which agglutination was negative, Bordet's reaction was decisive. We ought to add that one was able to confirm the diagnosis. . . "

" Let us add that other serums from normal individuals and those suffering from jaundice, syphilis with Wassermann reaction, and typhoid, never fixed the complement in the presence of plague bacilli."

J. H. T. W.

Hall (H. C.). i. **Diagnosis and Quarantine of Human Bubonic Plague.**—*Texas State Jl. Med.* 1920. Aug. Vol. 16. No. 4. p. 176.

——. ii. **Quarantine of Rodent Cases of Bubonic Plague.**—*Ibid.* pp. 176–177.

" In the presence of pathognomonic symptoms of pestis major, absolute quarantine should be instituted and maintained until routine laboratory verification of the diagnosis."

Pestis minor [mild cases of bubonic plague] may be easily overlooked and the rodent infestation of an entire city may become a fact, before the more serious forms of the pestilence appear to give the alarm. The history of this epidemic justifies this statement. At this time it is necessary " that all unexplained buboes be aspirated and examined . . . as the only subjective symptoms of this form of the disease will be found to be a muscular weakness and general malaise, out of all proportion to the slight fever and more or less tender and enlarged gland." Three cases at Beaumont were of this kind and might have been overlooked had not pestis major been present.

The septicaemic type would not ordinarily be diagnosed except during an epidemic.

The author gives directions for quarantine of patients in the premises and advises guards on the houses, and wire netting fixed round the buildings [cf. this *Bulletin* Vol. 13, pp. 327–328]. A proper supply of Haffkine's or other vaccine should be provided. The treatment with vaccine and anti-plague serum proved efficacious. [Monziols and Broca, this *Bulletin*, Vol. 15, p. 65 ; also Jackson, Vol. 9, p. 502.]

The second paper contains instructions for destroying and examining rats [see Vol. 13, pp. 327–328].

J. H. T. W.

Egypt. (Ministry of the Interior. Department of Public Health.) **Plague in Egypt during the Year 1919.**—15 pp. 1920. Cairo: Government Press. [Price P.T. 5.]

This Report consists entirely of "tables." The details cannot be given in full but the titles and main points of information may be of use :—

1. Details of cases of plague in 1919 :—From 79 localities there were 833 cases, among Egyptians, admitted to hospital, with 445 deaths; from 5 localities 44 Foreigners were admitted to hospital and 28 died.

2. Gives "monthly comparison of Plague cases and mortality during the years 1917, 1918 and 1919." May, June and July gave the greatest admission rates and highest death-rates. There were few admissions and few deaths during October, November; December and January.

Tables 3 and 4 give "Monthly incidence of cases and deaths of Plague" for 1918 and 1919. In both years the total number of cases and deaths was greater in Upper Egypt than in Lower Egypt.

J. H. T. W.

Mallanah (S.). **A Short Report on the Treatment of Plague by the Solution of Iodine and Camphor [& Thymol].**—*Indian Med. Gaz.* 1920. July. Vol. 55. No. 7. pp. 255–256. With 6 charts.

The author writes :—

"It is a matter of common observation that plague cases often die suddenly, even when they seem quite well after the cessation of fever, as a result of heart failure. . . .

"In order to test the effect of camphor in plague I have combined iodine and camphor, and prepared a solution consisting of equal parts of tincture of iodine and a solution of camphor and thymol in equal parts. Thymol and camphor dissolve readily when mixed together, and especially so when combined with tincture of iodine on account of the spirit it contains. . . .

"The fluid was injected directly into the bubo in from ½ to 1 c.c. according to the age of the patient. Children had 7½ minims and adults 15 minims of this fluid, the doses of the drugs being 7½ minims of tincture of iodine and 3½ grains of camphor and an equal amount of thymol for adults, and about 3¾ minims of tincture of iodine and 1¾ grains of camphor and an equal amount of thymol for children. The fluid is quite sterile and does not produce any abscess." (See table on opposite page).

J. H. T. W.

McCoy (G. W.) & Chapin (C. W.) **Utility of Anti-Plague Vaccines and Serums.**—*Public Health Rep.* 1920. July 9. Vol. 35. No. 28. pp. 1647–1650.

The authors review the history of prophylaxis and treatment by anti-plague vaccines and serums. They write :—

"In concluding this brief review of vaccination in plague we must state that we are not acquainted with any evidence indicating that vaccination has ever controlled an outbreak. . . .

It seems rather unfortunate to those who are called on for advice in connection with a plague outbreak to find that popular and professional

MALLANAH (S.)

List of Cases Treated by the Solution of Iodine and Camphor.

Serial No.	Age.	Sex.	Bubo.	Mental condition.	Condition of the bowel.	Temperature.	Date of admission.	Date of injection.		Results.	
								First.	Second.	Recovery.	Death.
1	25	F.	R. A.	Conscious	Constipated	103	17-2-20	17-2-20			22-2-20
2	30	M.	R. A.	,,	,,	105	18-2-20	18-2-20			19-2-20
3	12	F.	L. I.	Unconscious	,,	102	18-2-20	18-2-20		R.	
4	25	F.	R. I.	Conscious	Not constipated	102	18-2-20	18-2-20	26-2-20	R.	
5	45	F	R. I.	,,	,,	100	18-2-20	18-2-20		R.	
6	22	M.	L. A.	Delirious	,,	104	18-2-20	18-2-20		R.	
7	14	F.	L. I.	Conscious	,,	101	18-2-20	18-2-20		R.	
8	25	F.	R. A.	Clear	,,	103	19-2-20	19-2-20		R.	
9	5	F.	L. A.	Unconscious	Constipated	103	19-2-20	19-2-20			22-2-20
10	20	F.	L. A.	,,	,,	102	19-2-20	19-2-20			20-2-20
11	15	M.	L. I.	Delirious	Not constipated	101	20-2-20	22-2-20		R.	
12	30	M.	R. I.	,,	Constipated	105	22-2-20	22-2-20		R.	
13	35	M.	L. I.	Unconscious	,,	103	21-2-20	22-2-20			22-2-20
14	10	F.	L. N.	Delirious	Not constipated	104	21-2-20	22-2-20	26-2-20	R.	
15	50	F.	L. I.	Conscious	Constipated	101	22-2-20	22-2-20	[sic] 20-2-20	R.	
16	20	F.	R. I.	,,	Not constipated	102	22-2-20	22-2-20	26-2-20	R.	
17	60	F.	L. I.	Unconscious	,,	102	22-2-20	22-2-20		R.	
18	50	M.	R. I.	,,	Constipated	104	22-2-20	[sic] 23-2-20			22-2-20
19	25	M.	L. I.	Conscious	,,	103	1-3-20	1-3-20		R.	
20	40	M.	L. I.	,,	,,	101	23-2-20	23-2-30			3-3-20
21	26	M.	R. I.	,,	Not constipated	102	24-2-20	24-2-20		R.	
22	10	F.	R. I.	,,	Constipated	102	25-2-20	26-2-20		R.	
23	35	M.	L. I.	Delirious	,,	103	25-2-20	26-2-20			26-2-20
24	14	M.	L. I.	Unconscious	,,	104	25-2-20	26-2-20			26-2-20
25	40	F.	R. I.	,,	Not constipated	102	25-2-20	26-2-20			3-3-20
26	20	M.	R. I.	Conscious	,,	102	25-2-20	26-2-20			3-3-20
27	40	M.	R. I.	Unconscious	Constipated	102	25-2-20	26-2-20			27-2-20
28	35	F.	L. N.	Conscious	,,	102	26-2-20	26-2-20			3-3-20
29	16	F.	L. A.	Unconscious	,,	103	3-3-20	4-3-20			5-3-20
30	19	F.	L. I.	Conscious	Not constipated	100	3-3-20	4-3-20		R.	
31	20	F.	R. A.	,,	Constipated	101	3-3-20	4-3-20		R.	
32	12	F.	L. I.	Conscious	,,	100	4-3-20	4-3-20		R.	
33	50	F.	L. I.	Unconscious	,,	104	4-3-20	4-3-20			6-3-20
34	8	F	L. I.	,,	,,	102	7-3-20	7-3-20		R.	

interest is so frequently centred on the subject of prophylaxis by vaccines or serums and on treatment by serum when, in fact, the situation demands active measures against rodents."

[Cf. Reports of the Bombay Bacteriological Laboratory, this *Bulletin*, Vol. 15, p. 64 : Vol. 16, p. 44 ; also Mazzone, Vol. 15, p. 61, Monziols and Broca, p. 65, and Kraus, p. 66.]

J. H. T. W.

Uriarte (Leopoldo). **La profilaxis antipestosa y la enseñanza popular.** [Anti-plague Prophylaxis and Popular Instruction.]—*An. del Depart. Nac. Hig.*, Buenos Aires. 1919. Nov. and Dec. Vol. 25. No. 6. pp. 7–13.

This is a very useful paper on methods of popular instruction in anti-plague methods. The author insists on the destruction of rats and the fleas which convey this infection to man. He points out that without such deratization and without general good sanitation plague cannot be abolished. He recommends the issue of leaflets and illustrations, also the use of the kinema for general information. Vaccines and serums should be available in every area where plague occurs and the people should be encouraged—through the above mentioned methods of instruction—to apply to the centres where anti-plague vaccine is distributed.

J.. H. T. W.

Piciniini (Francesco). **Osservazioni epidemiologiche ed anatom-patologiche sulla peste nei ratti. Ricerche sperimentali sulla immunita dei ratti contro la peste.**—*Ann. d'Igiene.* 1920. Aug. Vol. 30. No. 8. pp. 484–496.

For diagnosis of plague in rats and the value of morbid anatomy see this *Bulletin*, Vol. 9, p. 86 (Williams). As it would not be practica to render all rats immune to plague infection it is better to destroy them in sea-ports and all other places where plague may appear.

J. H. T. W.

Ishiwara (K.), Kakinuma (R.) & Otahara (T.). [**Thermoprecipitin-Reaction of Animals dead of Plague. (1st Comm.)**].—*Tokyo Iji Shinshi* (*Tokyo Med. News*). 1920. Jan. 10. No. 2159. pp. 113–119.

The experiments were made chiefly with albino rats. The pancreas and liver were examined :—(i) immediately after the animal's death, (ii) after 24 hours, and (iii) after 72 hours. The viscera were first ground up, boiled for 10 minutes with 5 parts (by weight) of sterilized physiological salt-solution, then centrifuged, and the clear part at top was used as "antigen." Immunity-sera were obtained from either rabbit or horse. Thermoprecipitin-reaction could be found in the majority of cases. It is more evident with pancreas than with liver so far as the albino rat is concerned. Precipitinogen appears very rapidly in the emulsion of viscera when heated, though it is not the case at the ordinary temperature. No noticeable difference is found

in the results between the materials taken at different times (within the limit of 0–72 hours) after the animal's death. Stronger reactions were obtained with the individuals which show more marked pathological changes and greater number of bacilli in the viscera than in others. This method is considered valuable for a preliminary decision as to the presence of plague.

Hiroshi Ohshima.

Harrison (W. T.). **Plague in California Ground Squirrels.**—*Mthly. Bull. Cal. State Dept. Agric.* Sacramento. 1920. May-June. Vol. 9. No. 5–6. pp. 187–194. [Summarised in *Rev. Applied Entom.* 1920. Sept. Vol. 8. Series B. Pt. 9. pp. 157–158.]

Plague was first discovered in California in 1900, and the first epidemic of pneumonic plague to occur in the Western Hemisphere broke out in Oakland in Sept. 1919, as the result of one of the inhabitants shooting squirrels in the neighbouring hills and bringing them home and preparing them for food. Fourteen persons died. Eradication of these squirrels was begun in 1908; it is not possible to state to what degree this destruction must extend. Plague is most acute among young squirrels in the early spring and summer months; and is chronic among those that survive.

It is stated that the rat-flea, *X. cheopis*, remains infective for 30 days or more.

J. H. T. W.

CHOLERA.

i. Braafladt (Louis H.). **Asiatic Cholera : A Study of One Hundred Cases.**—*China Med. Jl.* 1920. May. Vol. 34. No. 3. pp. 243–251.

ii. Wylie (J. Herman). **Cholera in Paotingfu, 1919.**—*Ibid.* pp. 252–253.

iii. Snell (John A.). **Cholera in Soochow, 1919.**—*Ibid.* pp. 253–258.

i. Of the 100 cases 80 were men, 20 women. They were divided into two groups according to seveiity of symptoms :—" A ," more severe cases, " B," less so. The average age of " A " was 36 years, of " B," 23 years. On admission pulse rate, respiratory rate and temperature (axillary and rectal) were taken.

Treatment consisted of injections of hypertonic saline solution : sodium chloride 120 gr. ; potasssium chloride 6 gr. ; calcium chloride 4 gr. ; sterilized water 1 pint.

In addition, 15 cases in group " A " and 20 in group " B " were treated with Kaolin by the mouth, in doses of ℥ iii every hour to adults, if vomiting was severe. " After six to eight hours the vomiting usually abated somewhat, and the watery evacuations " decreased.

" Of the total of 100 patients 41 received hypertonic salt solution only, 24 salt solution and Kaolin, and 35 Kaolin only."

Of those receiving salt solution only, 9 (22 per cent.) died ; of those treated with saline and Kaolin 7 (29 per cent.) died ; while of those who received Kaolin only, 1 (2 per cent.) died, a woman with anuria at time of admission to hospital.

ii. The methods employed in diagnosis and the treatment adopted were much the same as in (i), but Dr. Wylie was careful to take the blood pressure of his patients, the most important point in considering the use of hypertonic saline solutions and the amount needed in each case.

" If the blood pressure was down to 80 mm. or below, or the specific gravity of the blood was up to 1063 or above, we gave an intravenous injection of hypertonic saline, using three pints for 1063, four for 1064," and so on.

iii. From July 28 to September 24, 1919, 62 cases of " what seemed to be real cases of Asiatic cholera " were treated, but no cultures were made. The symptoms, however were classical. The author and his colleagues " were called on to see more than 100 other cases which were supposed to be cholera but which we diagnosed otherwise ; most of these cases were either dysentery or malaria. Many patients, overcome by the fear of cholera, had interpreted their discomfort as being evidence of the disease." With regard to the use of saline injections, satisfactory investigations into blood pressure, etc., were carried out. The author rightly thinks that " treatment of the kidneys is perhaps the most important side issue. In our 62 cases casts were found in 48. Five patients died before a specimen of urine was obtained ; it is perfectly fair to assume that all of these patients had casts. Thus 85 per cent. of the cases were complicated with nephritis and two of the deaths were directly due to uraemia. . . .

" The large number of our cases which had flagellates in the faeces was interesting."

In this instance the method of grouping the cases was according to blood pressure, taken with a Tycos instrument. In group 1 (no appreciable loss of blood pressure) no one died; in group 2 one died and in group 3 (blood pressure below 70 mm.) sixteen died. None of the nurses or coolies contracted the disease.

J. H. Tull Walsh.

Tsen (Edgar T. H.). **Notes on the Etiology of the Last Cholera Epidemic.**—*Nat. Med. Jl. China.* 1920. Mar. Vol. 6. No. 1. pp. 49–53.

The author, working at the Union Medical College Hospital, Peking, deals with laboratory diagnosis of cholera as it was seen in China during 1919. He notes that "the Health Officer of Shanghai, however, reported it, as far as that port was concerned, not as cholera, but as "choleraic diarrhoea" [v this *Bulletin*, De Mello, Vol. 15, p. 77.], as the Shanghai Municipal Laboratory very rarely succeeded in isolating organisms from all the specimens examined which could definitely be identified as true cholera vibrios.

"They examined the stools from about 150 cases and found only eight having the appearance of true cholera asiatica. These eight cases were later more closely investigated and, from their stools, vibrios were separated in pure cultures. On the application of confirmatory tests, seven out of the eight cultures failed to react like true cholera vibrio. The eighth culture gave a specific agglutination with a cholera serum in a dilution of 1 to 1,000. Other investigators in other cities reported the epidemic as true cholera, basing their diagnosis either on the clinical picture alone, on the mere presence of comma-shaped bacilli in the rice-water stools, or on the definite identification of the vibrios isolated and studied. In Peking the morbidity was low and we had, therefore, the opportunity of examining bacteriologically only a few cases and from which we succeeded in isolating a few vibrios . . . Several vibrios isolated in Peking, Harbin, Paotingfu, and Tsinan during the last cholera epidemic have been studied morphologically, culturally, and serologically. These vibrios showed not only the morphological characteristics and cultural peculiarities of true cholera vibrio but also gave a positive agglutination reaction with a cholera patient's serum in dilutions of 1 : 150 to 1 : 200 and with an anti-cholera serum in dilutions of 1 : 10,000 to 1 : 15,000.

"In conclusion we may say that the last cholera epidemic, as far as Peking, Harbin, Paotingfu, and Tsinan were concerned, was caused by true cholera vibrios."

J. H. T. W.

Wu Lien-Teh & Chun (J. W. H.). **The Management of the 1919 Cholera Epidemic in Harbin.**—*Nat. Med. Jl. China.* 1920. Mar. Vol. 6. No 1. pp. 4–16. With 8 text-figs.

For a previous report upon this same epidemic see this *Bulletin*, Vol. 16, p. 30.

In the present report the authors give a detailed account of the sanitary and prophylactic measures employed during the epidemic.

They also give their opinion as to the favourable effects produced by treatment with the hypertonic saline solution :—

"(1) It replaced the large quantity of liquid which had been lost through the purging and vomiting.

"(2) It increased the tonicity of the heart.

"(3) It diluted the toxin in the system, produced by the vibrio.

"(4) It helped to clear away the cholera organisms in the alimentary canal."

J. H. T. W.

HOOPS (A. L.). **Experiences of Medical and Prison Work in a New Country (Kedah, Malay Peninsula).** [Cholera.]—*Jl. Trop. Med. & Hyg.* 1920. Aug. 2. Vol. 23. No. 15. pp. 189–198.

The author gives brief accounts of epidemics of cholera from 1907 to June 1914 which are represented by the following "table" :—

Year.	Approximate deaths from Cholera.
1907	500
1908	1,000
1911	1,500
Dec. 1913 to June, 1914	2,500
Total ..	5,500

He also deals with the spreading of the disease, preventive measures, the quarantine camp, Alor Star, and with treatment. The last section is the only one requiring further notice as showing the effect of modern methods of treatment chiefly introduced by ROGERS. Between Jan. and April 1914, 143 received hypertonic saline injections :—

Total Amount of Saline in Each Case.

Route and Mortality.

No. of Cases injected.	Total pints injected.	Route injected.			Deaths.			Total Deaths.	Percentage of Deaths.
		I. V.	I. P.	Mixed.	I. V.	I. P.	Mixed.		
2	2	1	1	—	1	1	—	2	100
31	3	3	28	—	3	8	—	11	35
20	4	13	7	—	4	2	—	6	30
11	5	2	5	4	2	5	2	9	82
14	6	3	5	6	1	3	3	7	50
18	7	3	1	14	3	—	8	11	61
13	8	6	4	3	3	4	2	9	65
8	9	—	1	7	—	1	4	5	62
11	10	—	1	10	—	1	7	8	73
6	11	2	1	3	2	1	3	6	100
3	12	—	—	3	—	—	2	2	67
2	13	—	—	2	—	—	2	2	100
2	14	—	—	2	—	—	2	2	100
1	15	—	—	1	—	—	1	1	100
1	17	—	—	1	—	—	1	1	100
143	—	33	54	56	19	26	37	82	57

"Two persons died after two pints had been injected. The value of the intraperitoneal route is shown by the fact that it was adopted in 28 out of 31 cases who received three pints, and that the mortality in this section was only 35 per cent., although the three intravenous cases died."

[These methods, their object and value will be more clearly understood by reference to VARIAN'S paper, see this *Bulletin*, Vol. 15, p. 83; also WU LIEN-TEH & CHUN (J. W. H.), Vol. 16, p. 30.]

J. H. T. W.

TSAKALOTOS (A. E.). **Ueber die Choleraepidemie in Corfù (März 1916.)** —*Schweiz. Med. Woch.* 1920. Mar. 18. No. 12. pp. 230–232.

This is a long article in German on a cholera epidemic in Corfu. There were 89 cases among the inhabitants and of these only four had been vaccinated. These four took the disease slightly. Inoculations were steadily carried out by Dr. Tsakalotos, who attributes the spread of the disease to prevalent intestinal troubles. The remnants of the Serbian Army, suffering to a great extent from these intestinal diseases, were in isolation camps in Corfu at the time. Water in the Island was not found to contain vibrios (apparently).

J. H. T. W.

GOMES (Antonio Braz). **Diarréas coleriformes de natureza vibrionaria ou colibacilar ?**—*Bol. Ger. Med. e Farmácia.* Nova-Goa. 1919. July. Vol. 5. No. 7. pp. 258–263. [Rec. July 1920.]

A record of cases which might have been caused by vibrios, or by *B. coli*. They presented symptoms which might have been due to vibrios of varying but not extreme virulence. In one district cholera had not been seen since 1900; in Gogola not since 1914 and in Simbor not since 1916. It may not have been possible to fix the infecting germ in each case. Bacteriological results are not given and diagnosis is left open. Probable methods of spread of infection are discussed.

J. H. T. W.

JORGE (Ricardo). **Le paracholéra et les porteurs de vibrions.**—*Med. Contemporanea.* 1920. March 7. Vol. 38. No. 10. pp. 73–75.

This interesting and well-written article is given below somewhat abridged :—

"Happy the man who shall give us the desired solution of the problem of the carrier of vibrios. . . We now record certain facts collected in Portugal and offering increased interest from a suggestive note written by Dr. Crendiropoulu concerning cholera epidemics possessing small clinical gravity, in which bacteriological examination discloses, often, only non-agglutinable vibrios; allusion being made to an *epidemic in Lisbon* caused by a vibrio truly cholera-like, which produced very slight mortality. This must refer to the epidemic of 1894, which appears in the table of epidemics in the recent French edition of Kolle and Hetsch . . . , with a similar conclusion. Now the above

description is inexact and I seize this opportunity to dissipate an equivocal statement which ought not to continue." [The author maintains that although in this epidemic the symptoms were those of cholera and the mortality slight the vibrio was not a true comma. He was present during the epidemic.]

" In the stools of the patients and in the waters of the town the regretted Camara Pestana found a vibrio which I had under observation at that time and which did not agree in characteristics with the vibrio of true cholera asiatica :—flagella two or three, difference in cultural characters, no pathogenic effect on guinea-pigs [v. this *Bulletin*, Vol. 16, p. 28, SANARELLI], absence of Pfeiffer's reaction, absence of agglutination (at a later period) with specific serum. In Berlin it was excluded from the cholera series . . . ; we are dealing with a *paracholera* caused by a paracholera vibrio of which different types are known. These . . . have been observed in the East at Massaouah, in Ceylon, etc., and lately, during the war, in the Balkans by M. Castellani. They may even be found with true cholera " [see this *Bulletin*, Vol. 16, p. 37, GREIG ; MEZINESCU ; LEMOIGNE].

In the epidemic of 1910 when the infection introduced into Portugal was traced to the steamer " Araguaya," out of 755 cases investigated in the laboratory of the Lisbon Institute only six carriers of bacilli were found. These were sailors of the gunboat " Zaïre.' Professors BETTENCOURT and KOLLE also, later, examined these germs and confirmed the findings of vibrios—not however very lethal for guinea-pigs. Nine sailors had been on shore at Funchal, from whence the infection came, and three of these men contained vibrios. Three others who had not left the ship were doubtless infected through their three comrades. The vibrios in these cases resembled the " El Tor " variety. The author desires further care in the examination of passengers, especially pilgrims, emigrants and soldiers on ships leaving or entering ports in which even mild cases resembling cholera have been noticed.

J. H. T. W.

SANARELLI (G.). **De la pathogénie du choléra (Deuxième mémoire). La " péritonite cholérique " du cobaye.**—*Ann. Inst. Pasteur.* 1920. Apr. Vol. 34. No. 4. pp. 271–284. With 1 coloured plate.

——. **Patogenesi del colera (ii Memoria). La " peritonite colerica " della cavie.**—*Ann d'Igiene.* 1920. July. Vol. 30. No. 7. pp. 381–394. With 1 coloured plate.

These articles record further experiments on guinea-pigs and the main " conclusion " is :—

" Guinea-pigs that die after an intraperitoneal injection of cholera vibrios do not die from the effects of the local reaction, that is to say of the peritonitis. On the contrary, they die when the infection of the peritoneum seems to have been already overcome, if not entirely recovered from. One must therefore seek elsewhere for the cause of death."

For previous work by the same author see this *Bulletin*, Vol. 14, p. 179 : Vol. 15, p. 81 and Vol. 16, p. 28.

J. H. T. W.

Sanarelli (G.). **De la pathogénie du choléra. (Troisième mémoire.) Le proteide du vibrion cholérique.**—*Ann. Inst. Pasteur.* 1920. June. Vol. 34. No. 6. pp. 370–391.

Continuing his experiments on guinea-pigs and rabbits, Prof. Sanarelli has arrived at a point where he considers the nature of the proteid toxin which is the cause of cholera. The material used is prepared as follows:—"A culture of vibrios 24 hours old grown on agar at 37° C. is made into an emulsion with 9 cc. of a 0·1 per cent. solution of carbonate of soda; 1 cc. of a 1 per cent. solution of pancreatin is added; 4 or 5 drops of toluene are added, the tube is well shaken and placed in an incubator at 37° C." On the following day there is a slightly opaline solution. The vibrios have been attacked and destroyed by the toluene and the pancreatin. "The pancreatin is incapable of dissolving living vibrios." The effects produced by the pancreatin and the small amount of toluene may be neglected. "A guinea-pig weighing 300 gm. receives no harm from an intravenous injection of a dose one hundred times larger (1 gm.) than that employed."

Physico-Chemical Properties. The proteid is precipitated by alcohol and ammonium sulphate to saturation; separated by means of the latter, filtered and carefully washed with a saturated solution of ammonium sulphate in order to eliminate foreign matters, it shows the presence of phosphorus; hydrated with H_2SO_4 it gives purin bases as confirmed with nitrate of silver. The conclusions arrived at are:—

1. The poison of cholera vibrios is the very proteid of the bodies of the bacteria.

2. [This proteid is set free by the method above described.]

3. Absorption by the peritoneum of the proteid as of the vibrios simply killed by heat is, in the guinea-pig, imperfect. It follows that minimum lethal doses of killed cultures, introduced by way of the peritoneum must be a multiple of the minimum lethal dose of a living culture.

4. The proteid does not manifest immediate toxicity except where introduced directly into the circulation. In this case the minimum mortal dose is the same as that of a living culture, and its action is not directly upon the nervous centres as maintained by certain authors, but attacks, *a tergo*, the mucous membrane of the alimentary canal, producing an acute and fatal gastro-enteritis.

5. The lesions produced in the mucous membrane of the intestines of the guinea-pigs by the proteid injected into the veins are absolutely the same as those observed after an intraperitoneal injection of a lethal dose of vibrios killed by heat.

6. That leads logically to the question whether the cause of death in guinea-pigs which succumb after an intraperitoneal injection of living culture is to be sought, not in a process of inflammation in the peritoneum, as has been held up to now, but rather in the severe lesions produced by the vibrios, or by their proteid, in the walls of the digestive tube.

7. In rabbits, the toxic action of the proteid extracted from the cholera vibrios, even if injected into the peritoneal cavity, shows elective action on the intestines, producing, according to the doses employed, fatal gastro-enteritis acute, sub-acute or chronic. These parietal infections characterized by severe lesions, anatomical and functional, are constantly accompanied by a prodigious multiplication of *B. coli* and may end in a general bacillary infection.

8. The toxic effect produced by the proteid of the vibrio on the organism of laboratory animals, apart from the grave parietal alterations caused *a tergo* in the digestive canal, does not reproduce any symptom which recalls, even faintly, the picture of the algid stage of cholera. It remains, therefore, doubtful whether one is able to call the substance extracted from vibrio cultures "cholera poison."

J. H. T. W.

Hehewerth (F. H.). **Aanteekeningen over diagnostisch-bacteriologisch Choleraonderzoek.** [The Bacteriological Diagnosis of Cholera.] —*Geneesk. Tijdschr. v. Nederl.-Indië.* 1919. Vol. 59. No. 4. pp. 540–554.

A discussion of the difficulties of bacteriological cholera diagnosis arising from the fact that non-cholera vibrios will grow readily on Dieudonné's alkaline blood agar and that in some cases these vibrios so closely resemble the specific organism in morphology and other characters, such as motility, that agglutination tests are required to establish a distinction. In a paper read by Van Loghem and Nieuwenhuijse before the Netherlands Society of Tropical Medicine [see this *Bulletin*, Vol. 12. p. 118] the authors advocate keeping the blood-alkali mixture for the preparation of Dieudonné plates under a layer of liquid paraffin and state that it can be so kept for months (as long a period as 10 months is spoken of) without losing its specificity. Hehewerth does not bear out this claim but states that while he found that, under liquid paraffin, the blood-alkali mixture lost its specificity somewhat more slowly than when exposed to the air, there was, at the end of six months, no longer any question of specificity. The author sums up the method he has been led to adopt as follows :—

"(1) The blood-alkali mixture is sterilized for half an hour on 3 successive days in a current of steam.

"(2) It is then kept under paraffin.

"(3) After ten days 'ripening' it is fit for use.

"(4) On the unexpected arrival of cholera material, if there are no Dieudonné plates ready, some plates are covered with blood-alkali mixture of different ages and some of the material smeared on some of the plates after these have been two hours in the incubator at a temperature of 37° C with the nutritive layer uppermost. The remainder of the material is added to peptone water.

(5) On the remaining plates, after a period of 6–8 hours, smears are made from the peptone culture.

"(6) A fresh blood-alkali mixture is prepared at least every 2 months, and is ready for use in 10 days.

"(7) If cholera is prevalent, so that the arrival of material for diagnosis is to be expected, care is taken, for safety and convenience sake, to have ready an ample supply of 24 hour old plates.

"Though the method of covering the blood-alkali mixture with paraffin has not given us quite the results hoped for it undoubtedly retards loss of specificity and this has seemed sufficient reason for adopting it in combination with the other measures outlined."

F. S. Arnold.

Davies (Arthur). **A Method of Cholera Diagnosis.**—*Jl. Roy. Army Med. Corps.* 1920. Oct. Vol. 35. No. 4. pp. 329–333.

The author describes a laboratory method for confirming the presence of vibrios. It is a macroscopic method carried out on a Garrow agglutinometer.

J. H. T. W.

Pergola (M.). **Vibrioni non colerigeni diagnosticati come colerigeni. Considerazioni sulla diagnosi batteriologica del colera.** [Non-Cholera Vibrios diagnosed as Cause of Cholera.]—*Ann. d'Igiene.* 1920. Mar.-Apr. Vol. 30. No. 3–4. pp. 153–163.

In October 1917 Dr. Pergola received two cultures marked V_1 and V_2, the former taken from the intestinal contents of an Austrian prisoner who died with symptoms of malignant tertian, the latter taken from the faeces of another prisoner who showing no symptoms was thought to be a "carrier." With serum from inoculated guinea-pigs an agglutination reaction was obtained: 1 : 2000 for V_1 and 1 : 7000 for V_2.

Morphological characters. Both are clearly vibrios, 1·5–3μ long and from 0·3 to 0·5μ thick; motile with one polar flagellum 5–6μ long; stain easily with dilute solution of Ziehl; Gram negative. Facultative aerobes, optimum temperature for cultures 37° C.

Cultures in broth and in peptonized water. V_1 and V_2 grow strongly and rapidly in these media producing a surface pellicle only when the culture is made direct from the guinea-pig. In subsequent cultures no surface layer is formed. They coagulate milk which becomes divided into two portions: a lower one of coagula and an upper one of yellow whey somewhat turbid.

Pathogenic properties. Very evident when injected into the peritoneal cavity of the guinea-pig. After 18 months of saprophytic life in ordinary agar the dose usually fatal to guinea-pigs weighing 300–350 gm. produces a septicaemia. Virulence of both germs is increased by passage from one animal to another.

V_1 and V_2 differ from true "comma" vibrios in agglutination.

J. H. T. W.

Table I. Agglutination Tests.

Strain of Vibrio.	Immune Sera used.	Dilutions of Immune Sera. 1–100	1–300	1–500	1–800	1–1000	1–2000	1–4000	1–6000	Controls with 0·8% NaCl Solution.	
V_1	SC_1	—	—	—	—	—	—	—	—	—	—
	SC_2	—	—	—	—	—	—	—	—		
	SV_1	+	+	+	+	+	±	—	—		
	SV_2	+	+	+	+	+	±	—	—		
V_2	SC_1	—	—	—	—	—	—	—	—	—	—
	SC_2	—	—	—	—	—	—	—	—		
	SV_1	+	+	+	+	+	±	—	—		
	SV_2	+	+	+	+	+	±	—	—		
CM	SC_1	+	+	+	+	+	+	+	+	—	—
	SC_2	+	+	+	+	+	+	+	+		
	SV_1	—	—	—	—	—	—	—	—		
	SV	—	—	—	—	—	—	—	—		
CV	SC_1	+	+	+	+	+	+	+	+	—	—
	SC_2	+	+	+	+	+	+	+	+		
	SV_1	—	—	—	—	—	—	—	—		
	SV_2	—	—	—	—	—	—	—	—		

+ equals complete agglutination. ± equals incomplete agglutination, — equals absence of agglutination.

TABLE II.

Strain of Vibrio.	Immune Sera used.	Dilutions of Immune Sera. 1–50	1–100	1–300	1–500	1–800	1–1600	1–2000	Controls with 0·8% NaCl Solution.	
V. of Metchnikoff.	SV_1	—	—	—	—	—	—	—	—	—
	SV_2	—	—	—	—	—	—	—		
V. of Finkler & Prior.	SV_1	—	—	—	—	—	—	—	—	—
	SV_2	—	—	—	—	—	—	—		
V. of Massaua.	SV_1	—	—	—	—	—	—	—	—	—
	SV_2	—	—	—	—	—	—	—		
V. of Kamaran.	SV_1	—	—	—	—	—	—	—	—	—
	SV_2	—	—	—	—	—	—	—		
V_1	SV_1	+	+	+	+	+	+	±	—	—
	SV_2	+	+	+	+	+	+	±		
V_2	SV_1	+	+	+	+	+	+	±	—	—
	SV_2	+	+	+	+	+	+	±		

SIERAKOWSKI (Stanislaw). **Ueber Mitagglutination bei Cholera. Beitrag zur Diagnose der Cholera.**—*Cent. f. Bakt.* I. Abt. Orig. 1920. Mar. 15. Vol. 84. No. 3. pp. 178–190.

This refers to certain vibrios which resembled true 'commas' except as to agglutination. [See PERGOLA above.]

J. H. T. W.

MIURA (Y.). **Experimental Study of the Sensitized Cholera Antigen.**—*Jl. of Immunology.* 1920. Mar. Vol. 5. No. 2. pp. 145–154.

The author reviews BESREDKA's work and tells how to prepare a cholera vaccine in the form of a powder :—

The suspension of bacilli from the agar culture is taken up in a watch-glass and placed in a desiccator provided with calcium chloride ; the air in the jar is pumped out and the jar allowed to stand, at room temperature, for forty-eight hours. When the vaccine becomes a brownish powder it is removed to an ampoule or tightly corked bottle. The powder thus prepared corresponds to 10 mgm. of living bacilli in 1 mgm. Before use, 0·2 mgm. powder is suspended in 1 cc. saline solution, containing 0·5 carbolic acid, and the suspension is well shaken. Experiments were performed on rabbits and on man. The results in the latter experiments are given in Table 4.

Conclusions.—" 1. The quantity of the agglutination [agglutinin] and bacteriolysin produced by the treatment. . . . . is nearly equal to that of the common sensitized vaccine.

" 2. The reaction on the part of the human body is very slight after the injection of either of these vaccines.

" 3. The sensitized vaccine powder does not decompose as rapidly as the common sensitized vaccine. It has been preserved for nineteen months without losing its value as an antigen. [See YABE, this *Bulletin*, Vol. 14, p. 184.]

J. H. T. W.

TABLE 4.

Reaction upon human body.

Name	Sex.	Age.	Constitution.	Occupation.	Nutrition.	Dose of Injection.	Temperature before Injection.	Highest temperature within 24 hours after injection.	General subjective symptoms.	Local reaction.
		yrs.				cc.	deg. C.	deg. C.		
S. S.	F.	26	Medium	Lodger in hospital	Good	1	36·1	36·2	Negative	Negative.
T. C.	F.	22	Superior	Lodger in hospital	Very good	1	36·6	37·0	Negative	Slight tenderness.
T. S.	F.	19	Medium	Lodger in hospital	Good	1	36·3	36·5	Lassitude	Negative
S. I.	F.	24	Medium	Lodger in hospital	Fair	1	36·1	36·0	Negative	Negative.
Y. F.	F.	26	Superior	Lodger in hospital	Good	1	36·6	37·0	Lassitude	Feeling of swelling.
K. T.	F.	20	Medium	Lodger in hospital	Good	1	36·4	36·0	Negative	Negative.
T. I.	F.	20	Medium	Lodger in hospital	Very good	1	36·3	37·0	Slight heaviness in head.	Tenderness.
M. K.	F.	23	Medium	Lodger in hospital	Very good	1	36·9	37·0	Negative	Negative.
M. K.	F.	26	Medium	Lodger in hospital	Very good	1	36·3	36·0	Negative	Negative
T. K.	F.	27	Superior	Lodger in hospital	Very good	1	36·4	36·5	Negative	Negative.
S.	M.	36	Medium	Official	Fair	1	36·5	36·6	Negative	Negative.
S.	M.	27	Superior	Official	Good	1	36·4	36·8	Lassitude	Slight pain.
M.	M.	33	Superior	Doctor	Very good	1	36·5	36·6	Negative	Negative.
S.	F.	42	Medium	Midwife	Good	1	36·5	36·3	Negative	Slight pain.
S.	F.	18	Superior	Business woman	Good	1	36·4	36·4	Negative	Negative.
O.	M.	33	Superior	Doctor	Good	1	36·2	36·9	Heaviness in head	Negative.
H.	M.	35	Superior	Military officer	Very good	1	36·7	37·1	Heaviness in head	Feeling of swelling.
S.	M.	18	Superior	Student	Very good	1	36·8	36·8	Negative	Negative.
M.	M.	37	Medium	Policeman	Fair	1	36·4	37·0	Negative	Negative.
I.	M.	33	Superior	Military officer	Good	1	36 6	36·5	Negative	Negative.

Takenouchi (Matsuziro). **Sensitized and Non-sensitized Vaccines in Cholera Immunization.**—*Jl. Infect. Dis.* 1920. May. Vol. 26. No. 5. pp. 441–446.

Comparing the value of sensitized and non-sensitized vaccines by means of experiments on guinea-pigs the author, working at the Institute for the Research of Infectious Diseases, Imperial University of Tokyo, has arrived at the following conclusions :—

"During the process of sensitization, the toxicity of cholera vaccine, as tested on guinea-pigs, is diminished greatly. This reduction of toxicity is caused not only by the washing, but also by the specific influence of anti-cholera serum on the toxic substances of cholera bacilli. . . .

* * * * *

"Careful selection of the test dose is a fundamental necessity for the infection tests on guinea-pigs that have been inoculated with cholera vaccines, either intraperitoneally or subcutaneously.

"In order to determine the comparative value of sensitized and non-sensitized cholera vaccine on intraperitoneal inoculation, further tests, using twice the lethal dose of cholera bacilli within 3–5 hours after the intra-peritoneal inoculation, must be employed on guinea-pigs.

"Non-sensitized cholera vaccine is markedly superior to sensitized cholera vaccine in protecting power for guinea-pigs inoculated subcutaneously. Non-sensitized cholera vaccine produces more bacteriolytic substance in the blood of rabbits inoculated subcutaneously than sensitized cholera vaccine. S. Yabe observed this same phenomenon in his experiments with cholera vaccines on human beings."

* * * * *

J. H. T. W.

ENTERIC FEVERS IN THE TROPICS.

Cruickshank (J. A.) & Lafrenais (H. M.). **Enteric Carriers.**—*Indian Jl. Med. Res.* (Spec. Indian Sci. Congress Number 1919). pp. 124–134.

1,886 British soldiers were admitted to the enteric Depot at Parel from hospitals in Bombay when convalescent. Of the total number :—

791 had been diagnosed as enteric fever.
633 ,, ,, ,, ,, paratyphoid A fever.
136 ,, ,, ,, ,, ,, B ,,
326 ,, ,, ,, ,, pyrexia of uncertain origin, or enteric group.

1,080 men were inoculated with T.A.B. vaccine.
712 ,, ,, ,, ,, typhoid ,,
94 ,, ,, never inoculated.

For culture purposes Conradi plates were found more reliable than Endo plates in the Indian climate. The total number of carriers detected among the 1,886 cases was 49 or 2 per cent. :—

34 carriers of *B. paratyphosus* A.
9 ,, ,, *B. typhosus*
6 ,, ,, *B. paratyphosus* B.

47 were faecal carriers and 2 urinary ; of the latter one was a chronic carrier of *B. typhosus*, the other a carrier of *paratyphosus* A.

The accepted definition of a " Temporary Carrier " is :—" A man who ceases excreting typhoidal bacilli within 3 months of the commencement of his illness, those who continue longer being classed as chronic carriers ; " but an Army Regulation now gives six months after admission to an enteric Depot as the limit of a temporary carrier. After that time the man is classed as a chronic carrier. The authors state that according to this latter definition :—" 13 of our men have become chronic carriers of whom—8 are carriers of *B. paratyphosus* A.

4 ,, ,, ,, *B. typhosus.*
1 is a carrier of *B. paratyphosus* B.

J. H. Tull Walsh.

Liston (W. Glen) & Goré (S. N.). **A Simple Method for detecting Faecal Carriers.**—*Indian Jl. Med. Res.* (Spec. Indian Sci. Congress Number 1919). pp. 107–123. With 4 plates.

Since carriers include not only convalescents from a known enteric infection but individuals outwardly healthy and at most suffering from some trivial complaint, the detection of such persons becomes very important and often very difficult. The " tables " which give briefly the methods used by other workers occupy six pages and are too long to reproduce in full. The following two methods have been selected from " Table I."

Collection & preparation of samples.	Quantity for plating directly and method of plating.	Solid medium.	Identification of Colonies.	
			Tentative.	Confirmatory.
(*a*) HARVEY (1908) Faeces brought in tubes by the men. About one gm. of faeces was emulsified in 5 cc. of tap water and allowed to stand for one hour.	Two or three drops of the supernatant fluid placed on one plate and spread. The same spreader without flaming was used to inoculate another plate.	Two plates of Drigalski-Conradi.	Slide agglutination.	Cultural, agglutination.
(*b*) FAWCUS (1909) Samples taken from morning evacuation. About ·5 gm. well rubbed in 20 cc. of sterile water and allowed to settle for 2 or 3 hours.	From one loopful to ·5 cc. taken from the surface of the liquid and spread on a large plate of	Brilliant green bile-salt lactose agar.		Cultural, agglutination.

(*a*) *Jl. R.A.M.C.* 1915. June. Vol. 24. p. 492 & Vol. 25. pp. 94 & 194.
(*b*) *Jl. R.A.M.C.* 1909. Feb. Vol. 12. p. 147.

The authors think that the value of isolated colonies has been overlooked. The main points of the "simple method" carried out by them are as follows:—

"Our experience . . . has been that the stool of an enteric carrier, when typhoid or typhoid-like bacilli are present in it, contains when voided so large a proportion of bacilli that the examination of a group of fifty distinctly isolated colonies planted on ordinary agar will suffice to detect their presence in the stool, and that methods involving the principle of enrichment are unnecessary, if pains are taken to secure sufficiently isolated colonies.

. . . . "The method is one which can be used by the general practitioner provided he secures some ordinary agar slopes, a graduated pipette marked in fiftieths of a cubic centimetre, a faeces emulsion tube, two platinum loops, some high titre agglutinating serum and a glass plate with hollows or some watch-glasses. A little sterile water or salt solution will also be required, together with a spirit lamp, some slides, stains and a microscope." . . . .

. . . . "The emulsion tube is an ordinary sample test-tube 3½ inches by inch bearing two marks, one indicating nine cubic centimetres and another ten cubic centimetres. A glass rod . . . serves to transfer the sample of faeces to the tube and to mix the sample in the water or saline which is used to make the emulsion." . . .

The platinum loops are 5 mm. and 1 mm. in diameter. The quantity of fluid carried by the 5 millimetre loop is about 0·02 c.c. The 1 millimetre loop carries about 1/20 of the 5 millimetre loop.

(1) Place 9 c.c. saline, or sterile water, in the emulsion tube and, with the glass rod add faeces until the fluid in the tube stands at 10 c.c., a 10 per cent. dilution of the faeces is thus secured. Mix well and leave for one hour to settle.

(2) Fill into four slide hollows, or into four small watch-glasses, 0·2 c.c. sterile water or saline. Label *a*, *b*, *c*, *d*,

(3) With the 5 millimetre platinum loop remove a loopful of the upper layer in the faeces emulsion tube and transfer to the fluid in the slide hollows, or the watch glasses. Mix well ; this will represent a hundredfold dilution of the original faecal sample.

(4) Transfer a full 5 millimetre loopful of fluid from slide-cavity *a* to cavity *b*. This equals a thousandfold dilution of the original sample of faeces.

(5) Transfer a similar loopful from *b* to *c* = a ten thousandfold dilution.

(6) Repeat by transferring a similar loopful from *c* to *d*. After mixing this will give a hundred-thousandfold dilution of the original emulsion.

(7) Sterilize the 5 millimetre loop in the flame. Prepare four well-dried agar slopes. Mark them *a*, *b*, *c*, and *d*. Slopes in tubes 6 inches by $\frac{3}{4}$ inch afford room for fifty to one hundred discrete colonies.

(8) Into tube *d* place a 5 millimetre loopful of fluid from cavity *d*, running it gently along the middle of the agar slope from top to bottom. Place the tube on the bench, resting on a rod or pencil, and the cotton-wool plug in front of it.

(9) In a similar way inseminate consecutively tubes *c*, *b*, and *a* from cavities *c*, *b* and *a*.

(10) In from 10 to 15 minutes the agar slopes will be dry and can be plugged and placed in the incubator to be examined after 24 hours.

"After 24 hours incubation select from the four tubes those which show discrete colonies. The selected tubes will generally be those marked *b*, and *c* representing ·02 c.c. of the one thousand and ten thousand dilutions of the faecal sample. . . .

"Colonies which give agglutination or clumping should be subcultured on a fresh agar slope and it is convenient at the same time to inoculate a tube containing Aschoff's lead acetate glucose agar from the suspected colony."

This may be examined after 24 hours incubation. "If there is no change, *i.e.*, neither gas formation nor blackening, the growth is almost certainly *B. typhosus*. If gas has developed in the medium and there is no blackening, the growth is probably *B. paratyphosus A*. If gas has developed and the medium has become black in parts, the growth is probably *B. paratyphosus B*."

J. H. T. W.

Pestana (Bruno Rangel). **A febre typhoide em S. Paulo. I ; II & III ; IV.**—*Ann. Paulist. Med. e Cirurg.* 1918. May, June, July. Vol. 9. Nos. 5, 6, 7. pp. 101–115 ; 123–136 ; 149–164.

A detailed statistical investigation of the history of typhoid fever epidemics in S. Paulo since 1894. Great reluctance has apparently been shewn in S. Paulo to admit that the main responsibility is with the water supply ; attempts have been made to incriminate flies, raw fruits, vegetables, milk and other food articles and the Bacteriological Institute of S. Paulo has incurred a good deal of unpopularity by its insistence on the importance of the rôle played by a faulty water supply. The author's investigations leave no doubt that that insistence is justified. He states that the supply channels are in many cases insufficiently protected from contamination, that the water taken from them has all the characters of a surface water, as shewn by analyses, that the Eberth bacillus has actually been found in the water supplying certain districts and that communication has been shewn to exist between the supply system and the sewers.

F. S. Arnold.

i. MacAdam (William). **An Account of an Infection in Mesopotamia due to a Bacillus of the Gaertner-Paratyphoid Group.**—*Jl. Roy. Army Med. Corps.* 1919. Aug. Vol. 33. No. 2. pp. 140–153. With 4 charts in text.

ii. Mackie (F. P.) & Bowen (G. J.). **Note on the Characters of an Anomalous Member of the Paratyphoid Group met with in Mesopotamia.**—*Ibid.* pp. 154–167. With 5 charts in text.

iii. Kennedy (J. A.). **Inagglutinable Paratyphoid Bacilli (? Paratyphoid C.) in India.**—*Ibid.* pp. 190–191.

i. Capt. MacAdam, R.A.M.C., isolated from the blood stream, while in Baghdad, between July and December 1918 " a series of organisms culturally and morphologically indistinguishable from *Bacillus paratyphosus* B " and was aware that similar findings were recorded from cases in other parts of Mesopotamia. The organism was obtained by blood-culture from 7 cases and, in 2 cases, was isolated at the autopsy from the lungs and spleen.

" An actively motile short stout Gram-negative bacillus, or coccobacillus, with some tendency to pleomorphic formation. The growth on agar is less transparent and oily in appearance than the usual paratyphoid cultures, and is usually more profuse. There is no liquefaction of gelatine. On MacConkey's medium the colonies are indistinguishable from paratyphoids. Biochemically the organism produces acid and gas in mannite, glucose, dulcite, maltose, galactose and arabinose [cf. this *Bulletin*, Stern, Vol. 13, p. 317], no change occurring in lactose, saccharose and inulin. Litmus milk becomes at first slightly acid, changing to alkalinity on the fifth to seventh day; there is no production of indol."

All strains of this bacillus were inagglutinable even in low dilutions of the high titre sera (Lister Institute) for *B. typhosus*, *B. paratyphosus A*. *B. paratyphosus B*. and *B. enteritidis* (Gaertner).

" Specific sera for three of the strains have been obtained by the immunisation of rabbits, a titre of 6,000 to 10,000 being reached without any difficulty. All the nine strains were agglutinated to practically the full titre, whereas two stock strains of *B. paratyphosus B* never showed any signs of clumping in higher dilution than 1 in 250."

ii. When we compare the description, given by Major Mackie and Capt. Bowen, of the " para C " bacillus, found in cases seen by them, with the data recorded above there can be little doubt that the two groups of bacilli belong to the same *variety* of *B. paratyphosus* B. " A motile Gram-negative coliform organism, growing freely on agar, and on MacConkey's plates as a semi-transparent, lactose non-fermenter of medium size." Sugar reactions :—

Lactose	.. ..	no change
Glucose	.. ..	A.G.
Mannite	.. ..	A.G.
Dulcite	.. ..	A.G.
Maltose	.. ..	A.G.
Saccharose	.. ..	no change
Indol	.. ..	—

Litmus Milk. Acid for one or two days. Turns Alkaline from third to seventh day.

There was no agglutination with type serum, nor with Gaertner group sera of high titre.

iii. The interesting point in Lt.-Col. Kennedy's paper is the belief that these aberrants varieties of *para.* B found in Mesopotamia resemble certain organisms found in patients treated in the Enteric Convalescent Depot, Naini Tal, in 1914 and in 1917. In a report for the Year 1917 the author wrote :—" Five strains are included in the

above figures (one from an Indian) all isolated in blood culture, which do not conform absolutely to either "A" or "B." They are definitely of a specific nature but do not give the typical serum reactions of either "A" or "B." One, at least, is apparently closely allied to *B. Gaertner.*"

[Variability is a very marked characteristic of *B. paratyphosus* B as a species, see this *Bulletin*, HIRSCHFELD, Vol. 13, p. 315, in which notice of other references will be found.]

J. H. T. W.

MACADAM (William). **Note on a Small Outbreak of Lobar Pneumonia in Baghdad due to a Bacillus of the Gaertner-Paratyphoid Group.** —*Indian Jl. Med. Res.* (Spec. Indian Sci. Congress Number 1919). pp. 226–232.

"Several inagglutinable coliform organisms culturally and morphologically indistinguishable from *Bacillus paratyphosus* B have been isolated from the blood stream by the writer in Baghdad . . . similar findings have been recorded in a number of cases in other areas of Mesopotamia." The cases were not "clinically suggestive of an 'Enterica' infection."

The bacillus was isolated from 5 cases. In 4 it was recognised by blood culture; in the fifth it was isolated at the autopsy from the lungs and spleen. All the strains gave the same morphological appearances: —"an actively motile short stout Gram-negative bacillus or cocco-bacillus, with some tendency to pleomorphic formation. The growth on agar was less transparent and oily in appearance than the usual paratyphoid cultures. . . . On MacConkey's medium the colonies were indistinguishable from the paratyphoids." On isolation all the strains were inagglutinable. After eight sub-cultures in broth, spread over a fortnight all the strains were agglutinable in para B serum dilutions of 200 and 250; later with further sub-cultures agglutination—1 in 2,500—was obtained by the macroscopic method. Negative results with other specific sera. The *post-mortem* examinations showed lobar pneumonia and enlarged spleen. The intestines were healthy.

J. H. T. W.

GARROW (R. P.). **A Case of Paratyphoid "C" Fever in East Africa.** —*Lancet.* 1920. June 5. pp. 1221–1222. With 1 chart in text.

This was a sporadic case and the only one discovered by the author. The patient was "a S. African white, aged 42, who had never been out of Africa . . . admitted to the 19th Stationary Hospital at Port Amelia (Oct. 1918) on the twelfth day of his illness with a temperature of 105° F. The routine thick blood film showed benign tertian malaria parasites, and diagnosis was made accordingly. The temperature continued between 102° and 104° F. in spite of 30 gr. of quinine daily by mouth, and on the 14th day of the illness with a temperature of 104°, no parasites were found on second examination of thick films."

The medical officer in charge of the case, Capt. C. KELSALL, was not satisfied with the diagnosis and asked the author to make a blood-culture. This was done on the 15th day of the illness.

"10 c. cm. of blood was withdrawn into a sterile syringe from a vein at the bend of the elbow, and discharged into 30 c. cm. of sterile ox-bile. The mixture was incubated at 37° C. for 24 hours and plated on Conradi medium." The result was a pure culture of an organism which resembled B. *paratyphosus* B but failed to "agglutinate with in low dilutions of any typhoid or paratyphoid serum available for testing (Lister Institute and Oxford sera, both active when tested with their homologous organisms). . . .

"The organism which on isolation was entirely inagglutinable in para. B serum now shows incomplete agglutination in all dilutions of B serum up to one-fourth titre."

[Varieties of B. *paratyphosus* B have been found by many observers in various regions—see Index of this *Bulletin*:—SARRAILLÉ and CLUNET; AZZO; WEIL; HIRSCHFELD; BROUGHTON-ALCOCK; MACKIE and BOWEN; MACADAM, etc.].

J. H. T. W.

LEWY (F. H.) & SCHIFF (F.). **Ueber menschliche infektionen mit einem Bazillus der Paratyphus gruppe vom Typus suipestifer (Baz. Ersindjan Neukirch, Bac. paratyphi β Weil). Nach Beobachtungen in der asiatischen Türkei.** [On a Human Infection due to a Bacillus of the Paratyphoid Group of Suipestifer Type. Experiences in Asiatic Turkey.]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1920. Jan. Vol. 23. No. 4. pp. 46–96. With 15 curves.

The authors review all the conditions in which this "Bazillus Ersindjan" resembles, and differs from, the bacilli of typhoid and those of the paratyphoid group. Their conclusions are as follows:—

During a period of about three years there occurred in Asiatic Turkey about 100 cases due to a particular infection by a germ allied to the Typhoid-paratyphoid group and, in type, resembling *B. suipestifer*.

The disease was recognised in soldiers and in the civil inhabitants of Haidar Pascha, in Taurus, in North and middle Syria, as well as in Palestine. The cases showed a picture of severe, often fatal sepsis and in mild cases resembled mild typhoid:—Rose spots, typical fever-curve, "typhoid" state and intestinal ulceration were intermingled.

Symptoms of dysentery, like those seen by NEUKIRCH in East Anatolia, were very frequent among the cases. They were not due to the Ersindjan bacillus infection but caused by known specific causes of dysentery bacilli as well as amoebae.

Diagnosis was confirmed by culture of the bacteria from the blood of the patients and from the various organs of the dead body; as, also, by means of specific agglutinating serum. During the autumn and winter 1918–1919, 21 cases were observed among German soldiers in Haidar Pascha. Of these 11 died. The cases are described with full details in the paper.

J. H. T. W.

LANTIN (Pedro T.). **A Comparative Study of Different Methods of Treatment of Typhoid Fever.**—*Philippine Jl. Sci.* 1919. Jan. Vol. 14. No. 1. pp. 19–53. With 10 charts in text.

The only part of this long article which requires special notice is the very excellent "Summary."

Between August, 1917 and February, 1918, ninety-eight cases of typhoid fever were admitted into the Philippine General Hospital. Certain other cases, 20 in number, are not included in the author's paper, "because they were already either convalescent or in a dying condition on admission." The patients were all Filipinos: 65 males and 33 females, ranging in age from 14 years onward.

The mortality rate in these ninety-eight cases is 19·38 per cent.; but excluding the hopeless cases, the death rate was 10·22 per cent.

The treatment of the cases has been carried out under two general groups, namely: (*a*) treatment with foreign protein, which includes sensitized and nonsensitized vaccine, peptone and milk; (*b*) treatment with colloidal preparations such as colloidal gold.

TABLE 23. Comparative Results of different Treatments.

Variety of treatment.	Mode of administration.	Patients.	Total average duration of disease.	Deaths.	
				No.	Per cent.
			Days.		
Sensitized Vaccine ..	Intramuscular	30	24·1	6	20·0
Classical	Control ..	21	27·7	5	23·8
Sensitized Vaccine ..	Intramuscular	10	27·7	3	30·0
Nonsensitized Vaccine	Intravenous ..	9	20·0	1	11·1
Peptone	Intramuscular	5	17·2	0	0
Milk	,,	8	21·0	2	25·0
Colloidal Gold ..	Intravenous ..	15	22·0	2	13·3
	Total ..	98			

J. H. T. W.

CATTORETTI (F.). **Ricerche ematologiche e serologiche nei tifosi trattati con vaccino eterologo (anti-colerico).** [Researches in Typhoid Patients treated with Anti-Cholera Vaccine.]—*Giorn. d. R. Accad. Med. di Torino.* 1920. Jan-Feb. Vol. 83. No. 1–2. pp. 13–17.

The points considered were :—

a. Variation in number of leucocytes and immunity. Great variation in the former according to course and end of case; especially the rapid initial diminution in percentage of neutrophils. The variation in anti-body in all cases showed marked diminution without reference to the curative effect.

b. Haemoculture negative generally.

c. The agglutination curve showed uniform decline in all patients independently of value of treatment.

J. H. T. W

Rose (F. G.). **Enteric Fever and Prophylactic Inoculation in British Guiana.**—*Trans. Soc. Trop. Med. & Hyg.* 1919. June 20. Vol. 13. No. 2. pp. 25–30.

"It would be difficult to exaggerate the importance of enteric fever as a cause of ill-health and death among the inhabitants of British Guiana. In Georgetown, the capital town, it is endemic with periodic effervescences, and among the 50,000 odd inhabitants of the town there were, in 1914, 154; in 1915, 196; in 1916, 190; in 1917, 272; and in 1918, up to October 31st, 206 notifications of enteric fever."

The author describes the imperfect sanitary conditions in Guiana and the backward state of public and personal hygiene. He quotes Harvey's classification of carriers :—

"1. Persons actua'ly suffering from enteric, who are excreting the bacillus in their faeces, or urine, or both : *a*, Recognized ; *b*, Unrecognized. 2. Persons who have recently passed through an attack of enteric, and are excreting the bacillus in their faeces, or urine or in both : Temporary carriers. 3. Persons who have had an attack of enteric fever more than six months previously, and are still excreting the bacillus in their faeces, or urine, or in both : Chronic carriers."

Inoculation is voluntary among the civil population and the protective vaccinations were carried out "chiefly in 1917 and 1918, though in the case of the East Coast and the East Bank districts, some were also done in 1916." A "table" is given showing, for twelve districts : population ; total number inoculated ; percentage inoculated, and notifications in each district during 1916, 1917 and 1918. The statistics may not be quite perfect owing to obvious difficulties arising among poor, careless and uneducated people who, as the author remarks, are slow in seeking medical advice. Nevertheless, the figures given by Dr. Rose, Govt. Bacteriologist, indicate that : "those centres in which a number in the neighbourhood of 10 per cent. of the population has been protected shew a distinct decrease in the number of notifications, with the single exception of the group of estates and villages on the East Bank." The main explanation, of the "exception" quoted, seems to be :—"the figure given for the number of inoculations has been based on the number of vaccines sent out from the laboratory, but, whereas unused vaccines are returned from some districts, it was discovered that those unused had been kept on the estates in some cases, including those at the Peter's Hall group of estates." It was not evident how many doses had been used.

J. H. T. W.

Crooks (Lewis A.). **A Short Note on Antityphoid Inoculation Showing its Effect on the Incidence of Typhoid Fever at the Stony Hill Industrial Schools.**—*Jamaica Public Health Bull.* 1917. [1st Year of Issue.] pp. 126–128.

The author recognizes the great value of anti-enteric vaccines and quotes figures, already well known to readers of this *Bulletin*, in support of their prophylactic qualities.

For many years cases of enteric fever frequently occurred among the inmates of the Stony Hill Industrial Schools. "The water supply is of doubtful quality being from tanks and surface wells and during

periods of drought is very deficient in quantity." Funds are lacking with which to provide a pure water supply. The schools contain more than 400 children between 6 and 16 years of age. No carriers were detected. Dr. TURTON, Medical Officer in charge, used an antityphoid vaccine prepared by Dr. SCOTT. The inoculations commenced in Feb. 1915, and in April of that year Dr. Crooks took over charge of the schools. Each child received the same dose.

Three injections were given at an interval of 14 days :—
1st injection 2 minims of 1,000 M to the cc. of *B. typhosus*
2nd ,, 4 ,, ,, ,, ,, ,, ,, ,, ,, ,, ,,
3rd ,, 8 ,, ,, ,, ,, ,, ,, ,, ,, ,, ,,

In 1916, the dose was increased to 3–6–9, and a mixed vaccine was used :—
1,000 M. *B. typhosus.*
500 M. *B. paratyphosus* A.
500 M. *B. paratyphosus* B. to each c.c.

No special precautions were taken after the injections and there were no general or local reactions of importance. At first the boys objected ; but when they found that the operations were painless there was no trouble, with better results.

Year.	No. of Inmates.	Cases of Enteric.
1912	435	23
1913	480	15
1914	487	12
1915	522	19
1916	510	6
1917	550	0

J. H. T. W.

i. FOX (J. C.). A Note on Vaccine Therapy in Typhoid and Paratyphoid Fever.—*Indian Med. Gaz.* 1920. August. Vol. 55. No. 8. pp. 282–284.

ii. TEAGUE (Oscar). Some Experiments Bearing upon the Intravenous Vaccine Treatment of Typhoid Fever.—*Proc. Med. Assoc. Isthm. Canal Zone.* 1917. July-Dec. Vol. 10. Part 2. pp. 9–19.

i. This paper was written in 1917, and the author was one of those who thought vaccine therapy useful. Enough has been written on this subject and will be found in volumes of this *Bulletin* from 1914 and onwards.

ii. This paper, also, was written in 1917, and is noticed somewhat late in time. Much of it is ancient history and needs no review.

J. H. T. W.

KALA AZAR.

Dodds-Price (J.). **Kala-Azar in Europeans in the Nowgong District of Assam.**—*Indian Med. Gaz.* 1920. Mar. Vol. 55. No. 3. pp. 87–89.

The paper describes the author's experiences of kala azar before and after the introduction of the tartar emetic treatment, which he wrongly ascribes to Rogers. [It was of course first introduced by Italian workers in the treatment of this disease in children in Italy.] He points out that kala azar is a very serious disease with a mortality of fully 90 per cent. and that if it had run an acute course like cholera or plague it would have been labelled the most deadly disease known to medical science. He has now given over 2,000 injections of tartar emetic in treatment of kala azar with a 67 per cent. rate of recoveries. He has been using a 1½ per cent. solution of sodium antimony tartrate, in one case commencing with 3 cc. and gradually working up to 8 cc. Illustrative cases are described and 12 of these are set out in tabular form showing the duration of the illness and the results. Now that a certain cure is available the percentage of recoveries should be nearly 100.

C. M. Wenyon.

Tournier (Elie). **Note sur un cas de Kala-azar infantile observé au Gabon.**—*Bull. Soc. Path. Exot.* 1920. Mar. 10. Vol. 13. No. 3. pp. 175–176.

The record of a case of kala azar in a child of 3 years of age in Mouila (on the Haute-N'Gounié, a tributary of the Ogowe, Gaboon). The observation shows that this disease must be considered in cases of splenomegaly not only in North Africa but also in the Equatorial regions. [See also this *Bulletin*, Vol. 8, p. 2, where a case on the Chari river is reported.]

C. M. W.

Javarone (N.). **Cronaca della Leishmaniosi infantile a Napoli e dintorni.** [Infantile Leishmaniasis in Naples and Neighbourhood.] —*Pediatria.* 1920. August. Vol. 28. No. 15. pp. 716–723.

From October 1913 to July 1920 one hundred and ten cases of infantile leishmaniasis were observed in the clinic of Professor Jemma at Naples. The cases all came from the town itself or its surroundings and the details are set forth in a list. The most interesting feature of this is the remarkable difference in the results obtained in the treatment of cases after the introduction of tartar emetic. Whereas a cure was the exception in the early cases it has become the rule in the later ones.

C. M. W.

Bramachari (U. N.). **Treatment of Kala-Azar with Intramuscular Injections of Hyper-Acid Antimonyl Tartrate (+ Urethane).**—*Indian Med. Gaz.* 1920. May. Vol. 55. No. 5. pp. 176–177.

The writer advocates the use of hyper-acid antimonyl tartrate in the treatment of kala azar. He states that if given intramuscularly in 1 per cent. solution it is "almost absolutely painless." [but we are left in doubt whether this was so with the 2 per cent. solution which he gave to the four cases cited]. The four cases received respectively 14 injections of $2\frac{1}{2}$ cc. of 2 per cent. solution, 15 of $2\frac{1}{2}$ to 5 cc., 17 of $2\frac{1}{2}$ cc., and 5 of $2\frac{1}{2}$ cc. These were given from twice to four times a week. The four patients treated were admitted to hospital in August, September, October and November, 1919, and the paper was evidently written in March, 1920, so the period of observation was not a long one. However, the author says the parasites disappeared from the spleen, which became reduced in size, and that fever ceased and the patients recovered in other respects. He says "It appears to me that the use of the hyper-acid antimonyl tartrate is one of the greatest advances in the treatment of kala-azar," yet immediately he follows this optimistic statement by an announcement that he is now using another preparation.

C. M. W.

Spagnolio (Giuseppe). **La cura del Kalazar infantile con i preparati di antimonio.**—*Giorn. di Clin. Med.* Bologna. 1920. May. Vol. 1. No. 5. pp. 182–186.

The paper commences with a historical review of the treatment of kala azar by tartar emetic since its introduction by Di Cristina and Caronia. The difficulties of intravenous administration in children led to other methods of treatment being attempted. The oral method with Castellani's mixture was tried but had to be abandoned owing to persistent vomiting and gastro-intestinal upset. The method of cutaneous absorption of tartar emetic by baths or by inunction did not give any encouragement. Finally intramuscular injections of acetyl-p-amido-phenyl-stibiate of sodium were tried. The solution used is in distilled water and is such that 1 cc. contains about 0·047 gram of the drug, corresponding to 0·0182 gram of metallic antimony or to 5 cc. of a 1 per cent. solution of tartar emetic. In order to render the injection painless the solution in distilled water contains a small quantity of alcoholic solution of ether of chloretone and camphor in equal parts. By way of experiment increasing quantities of the solution were injected, from 0·25 cc. to 1·5 cc. advancing to 2 cc. It was noted that the induration increased with the dose and disappeared in 5, 6, 7 or 8 days without any necrosis. This indicated that a dose of 1·5 cc. could be tolerated. This was equivalent to about 7 cc. of a 1 per cent. solution of tartar emetic. The injections were made at intervals of 5 to 7 days, and in a series of thirty cases permanently cured the treatment lasted for 4 to 5 months. If intravenous medication can be also used the cure is more rapid. [See also Manson-Bahr; this *Bulletin*, Vol. 16, p. 371.]

C. M. W.

Leslie (Percy C.). **Kala Azar.**—*Canadian Med. Assoc. Jl.* 1920. August. Vol. 10. No. 8. pp. 724–728. With 1 plate.

A general account of both kala azar and oriental sore. It is stated that both dogs and camels suffer from the latter disease. [The remark is true of dogs but has not been proved to apply to camels, though these animals have been suspected of having some etiological connection with the disease in man.]

C. M. W.

Nicolle (Charles), Blanc (Georges) & Langeron (Maurice). **Recherches expérimentales sur le rôle du gecko (*Tarentola mauritanica*) dans l'étiologie du bouton d'Orient. Mission de Tamerza (octobre 1919). Note préliminaire.**—*Bull. Soc. Path. Exot.* 1920. July 7. Vol. 13. No. 7. pp. 508–511.

Experiments were undertaken to test the accuracy of the hypothesis that in North Africa the gecko acts as a reservoir for the virus of oriental sore. Cultures from the heart blood of 12 geckos yielded leptomonas in two cases. The flagellates in these cultures were morphologically distinct from those in cultures of *Leishmania tropica*. The blood of one of the naturally infected geckos was inoculated intradermically to a man on two occasions and also to a monkey. The cultures from the first gecko were inoculated on two occasions to a man and once to a monkey, while the cultures from the second naturally infected gecko were inoculated to two men and intraperitoneally to two mice. In no case did infection occur. Intraperitoneal injection of the blood of infected geckos and of cultures of the flagellate also failed to produce infection in other geckos.

In cultures from the heart blood or organs of the gecko flagellates do not appear for 24–36 days, a fact which points to the marked scarcity of the parasite in the tissues of the host. The authors believe that the flagellate is only accidentally present in the system and that it has probably an intestinal origin.

The failures of the inoculation experiments are not in favour of the view that the gecko is a reservoir for the virus of oriental sore.

C. M. W.

Nicolle (Charles). **La question du réservoir de virus du bouton d'Orient. Hypothèse du gecko. Hypothèse du chameau.**—*Bull. Soc. Path. Exot.* 1920. July 7. Vol. 13. No. 7. pp. 511–515.

A rather speculative discussion on the subject of the camel acting as a reservoir for the virus of oriental sore. With the advent of the cold season the nomad tribes wander from the plateaux to the desert and with the hot season they return. It is along these routes that oriental sore is most commonly encountered in North Africa. If the camel is the reservoir one can suppose the disease to pass to man by contact with lacerations inflicted on the camels by the spiny plants or other agents. Attempts were made to produce infection in two camels by injecting large quantities of the cultural forms of *Leishmania*

tropica. The injections in one case were made intracutaneously and in the other intravenously. During an observation extending over 76 days no infection was noted though cultures were made from the blood on three occasions.

The author remarks that neither the gecko theory nor that of the camel has the support of experimental evidence.

C. M. W.

Ravaut (Paul). **Le premier cas de contagion du bouton d'Orient en France.**—*Bull. Acad. Méd.* 1920. Feb. 24, Mar. 2. & Mar. 9. Vol. 83. Nos. 8, 9, 10. pp. 198–202.

This paper describes a case of oriental sore in a girl of twelve years of age who had never been out of France. The disease, which was in the form of a lesion near the left nostril and another under the right eye, was contracted at Beixas in the Eastern Pyrenees. The presence of typical leishmania in the films was confirmed by Mesnil, to whom the writer submitted his preparations. No previous case of this disease has been recorded from France.

C. M. W.

Ravaut (P.). **Deux cas de Bouton d'Orient contractés en Espagne et en France. (Premier cas de contagion en France).**—*Bull. Soc. Path. Exot.* 1920. Apr. 14. Vol. 13. No. 4. pp. 235–238.

An account of two cases of oriental sore, one contracted in Spain, the other in France. The latter has already been noted in a previous communication. Diagnosis was made by discovery of the organism.

In the discussion which followed the reading of the paper Brumpt expressed the opinion that the Leishmania found in cutaneous lesions is a collective species, which will be separated when our knowledge is more advanced.

C. M. W.

MacCormac (Henry). **Case of Delhi Boil.**—*Proc. Roy. Soc. Med.* (Section of Dermatology). 1919. Aug. Vol. 12. No. 9. pp. 70–71.

The record of a case of oriental sore of Mesopotamian origin. Treatment was by ionization with a solution of sodium hypochlorite with only a feeble current, not more than 1 ma. to the square inch. Rapid healing was brought about. The writer remarks that he records this case, "as the forms of treatment hitherto used have on the whole proved unsatisfactory." [Most observers who have used the tartar emetic treatment, however, speak very favourably of the drug.]

C. M. W.

Photinos (Georges-Th.). **Un nouveau traitement du Bouton d'Orient (de Crète) par des injections locales de chlorhydrate d'émétine.**—*Bull. Soc. Path. Exot.* 1920. Apr. 14. Vol. 13. No. 4. pp. 290–297. With 1 plate.

A new method of treatment of oriental sore by injections of emetine hydrochloride is described in this paper. It consists in the local

injection around and below the sore, both subcutaneously and intracutaneously. The amount of drug injected varies with the size of the sore. For small ones the size of a lentil 0·01 gram injected in several places round the sore is sufficient, in larger sores with the area of a franc 0·05 gram was used. Such doses can be given at one sitting and this will suffice to bring about a cure in 15 to 30 days. In the case of larger or multiple sores the requisite amount of drug cannot be injected on one occasion.

The paper describes the injections in detail. They are made with a fine needle and the solution is forced into the skin, which becomes blanched for a few minutes but soon turns red. The whole area round the sore is injected with the drug.

Twenty-three cases treated in this manner are mentioned in the paper and in all of them a satisfactory result was obtained.

C. M. W.

PATRICK (Adam). **A Case of Multiple Oriental Sores (Leishmaniasis) Treated by Intravenous Injections of Antimony.**—*Glasgow Med. Jl.* 1920. Sept. Vol. 94. New Series, Vol. 12. p. 177.

A case of oriental sore, in which seven ulcers were present, was treated by bi-weekly injections of tartar emetic. Eleven injections were given; the dose commencing at 0·04 gram was increased to 0·12 gram. Healing was complete and the sites of the ulcers were represented by brown pigmented scars.

C. M. W.

DA SILVEIRA (Romeu). **Frequencia e Distribuição da Leishmaniose em S. Paulo.**—*Brazil Medico.* 1920. Mar. 27. Vol. 34. No. 13. pp. 200–206. With 1 chart & 1 map in text.

This is an interesting paper describing the cutaneous leishmaniasis of San Paulo. It is largely statistical and is illustrated by a spot map showing the distribution of the disease. It emphasizes the importance of the malady from the economic point of view. The paper ends with a series of conclusions which are as follows:—

1. The disease most frequently attacks the uncovered portions of the body although it may appear on other parts.
2. The incubation period is 2 to 3 months.
3. Infection of the mucosa follows in about 20 per cent. of the cases.
4. Hospital statistics reveal an increase in the incidence of the disease during the last few years.
5. It is not limited entirely to inland districts.
6. The district of Noroeste is most heavily infected and contributed 55 per cent. of the cases in LINDEMBERG'S clinic.
7. The malady is contracted for the most part in the virgin forests and these appear to be most dangerous during the first years they are worked. Hence new towns are most heavily infected.
8. The disease follows the advance of civilization into uncultivated districts.
9. It most frequently attacks men, who contribute 94 per cent. of the cases.
10. Marshy districts appear to be the most favourable localities for dissemination of the parasite.
11. In S. Paulo leishmaniasis occurs in the marshy tracts along the large rivers.

12. Infection takes place almost exclusively in the autumn or last months of summer.

13. The number of cases seen in S. Paulo between 1914 and 1919 reached approximately 15,000.

14. It is during their most productive stage of life that individuals are attacked.

15. All races are equally liable to infection.

16. The disease causes an annual loss of one thousand million reis when considered from the point of view of the productive power of the healthy individual.

17. The disease is distributed throughout the State of S. Paulo, except in the valley of Ribeira de Iguape.

C. M. W.

Tejera (E.). **La Leishmaniose américaine au Venezuela.**—*Bull. Soc. Path. Exot.* 1920. Apr. 14. Vol. 13. No. 4. pp. 238–240.

Cutaneous leishmaniasis is a disease which is very common in Venezuela. It is only rarely that infection of the mucosae takes place and the author notes that this is remarkable, since this form of the disease is so common in Brazil. He wonders if two species of parasite are responsible for this difference.

Treatment with tartar emetic has given very good results. Only one refractory case was seen, that of an Englishman with a lesion on the ear. He received 50 injections of 10 cgm. of the drug without any but a temporary improvement. Several samples of the drug were used but with no better result. He was then treated with novarsenobenzol with no success. After this he sought the advice of a native Indian, who brought about a cure in a few days by the use of herbs.

C. M. W.

Torres (Octovio). **A Case of Multiple Lesions in Leishmaniosis.**—*New Orleans Med. & Surg. Jl.* 1920. Aug. Vol. 73. No. 2. pp. 61–66. With 3 illustrations.

The paper describes a remarkable case of multiple cutaneous lesions due to leishmania in Bahia, Brazil. In all there were 248 separate lesions on various parts of the body. It is supposed that the infection was spread to the skin surface generally by the constant scratching which the patient practised, the whole condition extending from a single lesion on the leg. The character of the condition is well illustrated by photographs of the legs and face. The patient was treated with injections of protosan and tartar emetic and was making very good progress when he contracted pneumonia from which he died.

C. M. W.

RELAPSING FEVER.

HAROLD (C. T. H. H.). **Relapsing and Mianeh Fevers in East Persia.** —*Jl. Roy. Army Med. Corps.* 1920. June. Vol. 34. No. 6. pp. 484–498. With 8 charts in text.

The paper contains an account of the author's experiences with relapsing fever when he was D.A.D.M.S. (Sanitary) on the Lines of Communication in East Persia.

He is of opinion that the ordinary louse-borne disease with the typical symptoms occurs but that there is another form of a different type which is conveyed by *Argas persicus*. He brings forward evidence to show that *Argas persicus* bites man but it must be admitted that his evidence is mostly second-hand. He says that at Birjand he noted *Argas persicus* in his billet but he does not tell us he was bitten by them —presumably he was not. The evidence of the tick transmitting the relapsing fever of the Mianeh type is the reputed absence of lice and the history of men having stopped in places with bad reputations and where *Argas persicus* was known to occur. In one case of infection it is suggested that the disease was conveyed by bugs which infested the bed on which the man slept.

As the author remarks, it is a pity no Field Laboratory was available, as he evidently had an opportunity of clearing up the much disputed question of Persian relapsing fever. The evidence he brings forward is very suggestive but it is not conclusive. The matter will never be settled till properly conducted observations are made.

C. M. Wenyon.

NEWCOMB (Clive). **On an Outbreak of Relapsing Fever in Turkey in 1918.**—*Indian Med. Gaz.* 1920. June. Vol. 55. No. 6. pp. 208–217. With 1 chart.

This paper describes an outbreak of relapsing fever in April to June 1918 at Tel Hadi, one of the camps in Northern Mesopotamia on the construction route of the Bagdad railway. Amongst a mixed population of about 800 people of fifteen nationalities there were 66 cases of the disease, all of which were diagnosed microscopically. The disease was undoubtedly carried by lice and its course was a typical one. There was one death, in a case showing jaundice. Treatment was very successful with neosalvarsan, a dose of 0·45 gram being found the best in preventing relapses.

The paper is a long one and discusses the history of the subject and the observations of other workers but these need not be mentioned here.

C. M. W.

DEL PRADO (Eleodoro). **Datos para el estudio de tifus recurrente en el Perú.**—*Crónica Méd.* Lima. 1919. Dec. Vol. 36. No. 678. pp. 408–415.

A study of the history and distribution of relapsing fever in Peru, in which country the disease has been endemic and widely distributed since 1856.

F. S. Arnold.

Costiniu (A.). **Les affections des oreilles et du larynx survenues comme complications du typhus exanthématique et de la fièvre récurrente.** —*Presse Méd.* 1920. July 7. Vol. 28. No. 46. pp. 453–454.

In typhus and relapsing fevers affections of the ear were observed in 70 per cent. of the cases. In 10 per cent. of these the internal ear was involved. The condition as a rule clears up, but relapses are not uncommon. The majority of the cases are secondary to a naso-pharyngeal affection. In 15 per cent. of typhus cases laryngeal complications arise chiefly in the form of atypical diphtheria which manifests itself during convalescence. The incidence of these complications is very much reduced if careful naso-pharyngeal antisepsis is practised during the course of the illness.

C. M. W.

Weichbrodt (R.). **Rekurrensinfektionen bei Psychosen und experimentelle Untersuchungen über Rekurrensspirochäten.** [Relapsing Fever in Mental Patients and Experimental Researches on Relapsing Fever Spirochaetes.]—*Deut. Med. Woch.* 1920. June 17. Vol. 46. No. 25. p. 678.

The author has undertaken the investigation of the response of various nervous diseases to infection with the spirochaete of relapsing fever. Two distinct strains of *Spirochaeta duttoni* were used—the Elberfeld strain and the Hamburg strain. The latter is the strain used by Plaut and Steiner in their similar investigations (see this *Bulletin*, Vol. 16, p. 172).

It is too early to speak of the effect of the spirochaetal infections on the nervous conditions but it is the author's impression that there is a better response in the case of malaria than in these.

Spirochaetes were found by the dark ground method in the blood of the inoculated cases 10 to 24 hours before the onset of fever. They were also found in the blood by this method after the first attack but not after the relapses. That spirochaetes persist in the blood after all symptoms have disappeared is proved by inoculation into mice, which may be infected as long as 42 days after. The Wassermann reaction was very favourably influenced by the inoculation with *Sp. duttoni.*

The cerebro-spinal fluid did not reveal spirochaetes on dark ground examination but inoculated into mice when the spirochaetes had become numerous in the blood it gave rise to infection. The fluid showed a temporary lymphocytosis but it quickly returned to the normal.

When the two strains were employed it was noted that in mice the immunity was specific for each strain. Reinoculation with the other strain produced infection. The serum from a patient recovered from the infection mixed with infected mouse blood containing the same strain would not produce infection in a man not previously inoculated with this strain. The serum of patients recovered from the Hamburg strain infection was mixed in varying dilution with the Hamburg strain spirochaete in mouse blood. After standing an hour mice were inoculated but failed to become infected. Employing the Elberfeld strain the undiluted serum [? of the Hamburg strain] did not prevent mice becoming infected.

C. M. W.

Todd (John L.). *Spirochaeta recurrentis*: **a Filter Passer.**—*Jl. Parasit.* 1920. Mar. Vol. 6. No. 3. pp. 152–154.

This paper records the results of a series of careful experiments devised to test the possibility of *Spirochaeta recurrentis* being able to pass through a "W" Berkefeld filter and the power of centrifugation in throwing down spirochaetes. Nine filtration experiments were made with the blood and ground-up organs of rats at the height of their infection. This material in citrate saline solution was first filtered through a well-impacted Buchner filter. The filtrate so obtained was mixed with culture of *Bacillus prodigiosus* and passed through a Berkefeld filter at a pressure of 50 to 90 pounds to the square inch. In all cases the filtrate gave no culture of the bacillus, yet in seven cases rats inoculated with the filtrate became infected with spirochaetes which were actually seen in the filtrate in two cases. In order to compare the value of the thick film method of blood examination 69 observations were made in which blood which might easily contain spirochaetes was examined simultaneously by the thick film method and by the dark ground. Of these, 26 were positive by the dark ground method and 25 by the thick film. In four instances spirochaetes were seen only in the dark ground slide and in three only in the thick film.

After centrifuging fluid containing spirochaetes at 1,400 to 3,500 revolutions per minute for periods ranging from 20 minutes to 4 hours spirochaetes were still present in the upper layers of fluid, as proved by inoculation of white rats.

C. M. W.

Todd (John L.). **Latent Infection in Experimental Spirochaetosis.**—*Proc. Soc. Experim. Biol. & Med.* 1920. Jan. 21. Vol. 17. No. 4. pp. 83–84.

During a study of immunity in white rats which had recovered from infections of *Spirochaeta recurrentis* the author was led to investigate the question of the persistence of spirochaetes in rats from which they had disappeared when tested by ordinary blood examination.

Several methods were tried, such as killing the animal and inoculating large quantities of blood into new rats. The most satisfactory results, however, were obtained by aspiration of heart blood, 1 to 2·5 cc. of blood being taken without apparent injury to the animal. The animals were chloroformed for the operation. In this way spirochaetes were shown to be present in an apparently immune rat 32 days after the parasites were last seen by the daily examination of blood films. It is only occasionally that such latent infections can be demonstrated in apparently immune rats.

C. M. W.

Mühlens (P.). "**Bronchial-Spirochätosis.**"—*Arch. f. Schiffs- u. Trop.-Hyg.* 1920. June. Vol. 24. No. 5. pp. 139–142.

The paper discusses the question of Castellani's broncho-spirochaetosis. The disease has been observed chiefly by French and English observers and it is noteworthy that German literature contains little reference to the occurrence of spirochaetes in the sputum. The author

thinks this merely an indication that German pathologists have regarded them as of little importance. He points out the frequency with which spirochaetes are found in enormous numbers in inflammatory conditions of the mouth and pharynx and suspects that under suitable conditions they may spread to the lungs and bronchi. He has found them in great numbers in cases of gangrene of the lung. The question is whether they are to be regarded as primary agents in the causation of the lesions or not. He is of opinion that no proof of this has yet been produced, and considers that bronchospirochaetosis, as Castellani regards it a characteristic disease of tropical and subtropical countries—is not recognizable.

C. M. W.

Carini (A.). **Un cas de spirochétose bronchiale au Brésil.** *Bull. Soc. Path. Exot.* 1920. July 7. Vol. 13. No. 7. pp. 500–501.

The description of a case of bronchial spirochaetosis from Ste. Paulo, Brazil. There was blood stained expectoration which contained numerous spirochaetes. Treatment was carried out by injections of neosalvarsan and sodium iodide, and tartar emetic and Fowler's solution by the mouth. A kind of vaccine therapy was also tried in which the sterilized expectoration was injected. Though kept under observation for several months the patient did not improve nor get rid of his infection.

C. M. W.

Browne (C. Leslie). **Broncho-Pulmonary Spirochaetosis (Castellani) simulating Pulmonary Tuberculosis.** *Lancet.* 1920. May 29. p. 1164.

Two cases of pulmonary disease in which large numbers of spirochaetes were found in the sputum are recorded from Clare Hall Sanatorium, England. In both these cases examination for tubercle bacilli was negative. The signs were those of bronchitis with bloody expectoration, there was no fever and the patients were fairly well nourished. Both had bad teeth in the exudate from which enormous numbers of spirochaetes occurred. One case was treated with kharsivan and the spirochaetes diminished but did not entirely disappear; the second case was treated with arrhenal without much result. This drug had also been tried in the first case before the kharsivan treatment. The second case refused kharsivan but was discharged with the spirochaetes much reduced in number.

C. M. W.

de Mello (Froilano). Un cas de spirochétose pulmonaire à type sanglante de Violle.—*Bol. Ger. Med. e Farmacia.* Nova Goa. 1919. June. Vol. 5. No. 6. pp. 223-226. [Received July 17th 1920.]

A case of spirochaetal bronchitis with expectoration of bloodstained sputum described in detail.

C. M. W

Valassopoulo (A.). **La spirochétose ictéro-hémorragique en Egypte.** —*Bull. et Mém. Soc. Med. des Hôpit. de Paris.* 1920. July 1. Vol. 36. No. 23. pp. 942–944.

This paper draws attention to the similarity existing between the disease known in Alexandria as "*typhus bilieux*" and Weil's disease or icterohaemorrhagic jaundice. Serum from a patient was sent to Paris where it was tested against the organism with results which point to the identity of the two diseases. This view has already been brought forward by the author but has been subject to criticism. He is, however, convinced that the disease in Alexandria is in reality infectious jaundice, a conclusion which is supported by Martin and Pettit in their treatise on this disease.

C. M. W.

Komatsu (T.). [**Notes on** *Spirochaeta ictero-haemorrhagiae.*]—*Saikingaku Zasshi* (*Jl. of Bacteriol.*). 1919. Dec. 10. No. 291. pp. 873–894.

As culture-medium for the Spirochaeta the author finds one made according to Hata's formula most suitable: viz.—250–300 cc. of equine serum diluted with distilled water up to 2 litres, to which is added the whole blood of a medium-sized rabbit. In this medium the spirochaetes are found most vigorously growing 2 weeks after inoculation, and remain in a similar condition for 4–5 weeks. Afterwards they gradually decrease in number, become sluggish, and grow as long as 3–5 times the normal length. Even in such a declining state their infective character is retained for a considerable period. Although at temperatures between 22° and 25° C they attain their height of vigour very quickly—even at the 3rd to 5th day—they can grow fairly well both in a thermostat at 37° and under ordinary indoor temperatures at all seasons. It is preferable to make the culture medium slightly alkaline, but, contrary to the results of both Inada and Noguchi, the author finds that the spirochaetes are neither aerobic nor anaerobic. The observation that the albino rat is with difficulty infected by this spirochaete is confirmed. The mouse is absolutely refractory, whilst the guinea-pig is very easily infected. The author intended to attempt infection of a wild rat, *Microtus montebelli*, but as in many of these there was found in the urine, as well as in the kidney, a form of spirochaete hardly distinguishable from the species in question, this experiment had to be abandoned.

The spirochaete under consideration differed from other species in showing a marked resistance to the action of saponin; it can even withstand a 10 per cent. solution of this reagent. Experiments with arsenic, mercury and silver compounds, quinine and urotropin with their derivatives, haemolytic substances, lipoids, amino acids and various dyestuffs show that none of them are satisfactory from a therapeutic point of view.

Hiroshi Ohshima.

Smillie (Wilson G.). **The Prevalence of** *Leptospira ictero-hemorragiae* **in the Wild Rats of São Paulo, Brazil.**—*Bull. Soc. Path. Exot.* 1920. July 7. Vol. 13. No. 7. pp. 561–568. With 1 chart in text.

The paper records the results of an investigation of the rats of São Paulo undertaken for the purpose of determining the incidence of their

infection with the leptospira of infective jaundice. The author's summary is the following :—

1. The kidneys of forty-one normal appearing rats captured in the city of São Paulo were inoculated into guineapigs with the result that four of the guinea pigs developed typical symptoms of epidemic jaundice, and *Leptospira ictero-hemorragiae* were found in their organs.

2. Three of four strains of Leptospira were cultivated according to the method A of Noguchi.

3. A large proportion of the guinea pigs inoculated with rat kidneys developed a high immunity to a virulent strain of *Leptospira ictero-hemorragiae*. Thus it seems probable that a large per cent., 75 per cent. or more of São Paulo rats, harbour *Leptospira ictero-hemorragiae* of a low virulence which produced immunity in the guinea pigs, without producing objective symptoms.

C. M. W.

Kusama (I.), Kobayashi (R.) & Kuzunshi (K.). **Spirochaete of Rat-Bite Fever.** *Saikingaku Zasshi (Jl. of Bacteriol.)* 1918. Apr. 20. No. 271. pp. 1–40.

[From Review by R. G. Mills.]

In the domestic white rat and guinea pig the spirochaetes are found in the tissues of the lips, eyelids, tongue and frequently in the lymphatic and salivary glands. They are numerous in the testes, and in the adventitia of the aorta, and the media of the pulmonary and renal artery.

The spirochaete is not excreted with saliva from the salivary glands. It is possible that it may penetrate into the deeper layers of the epithelium of the mucous membrane of the mouth and then reach the oral cavity as the epithelium is shed. It is rarely excreted in the urine (1 per cent. of guinea pigs). It was not found in the bile, or intestinal contents.

The spirochaete escapes mainly through an abraded area in the mucous membrane or skin injuries which are commonly present in lips and gums of the rat. It is conveyed to a normal animal by the bite of an infected animal. Healthy animals caged with infected animals did not become infected unless bitten.

Instillation of suspension of spirochaeta into the eyes and feeding with organs of infected animals caused infection in only a small percentage of cases.

Guinea pigs, domestic and white rats, and mice are susceptible to infection with the spirochaete from the domestic rat, from the field mouse and from man. Guinea pigs show fever, loss of weight and falling out of hair. Rats and mice show no symptoms.

The Japanese monkey shows fever with infection with the spirochaete from the domestic rat, and from man, but not from the field mouse.

In their reactions to immune serum, the spirochaetes from man, monkeys, domestic and white rats, mice, and guinea pigs are the same.

C. M. W.

KOBAYASHI (Rokuzo) & KODAMA (Makoto). **A Contribution to the Study of *Spirochaeta morsus-muris* in the Nippon Field Vole (*Microtus montebelli*).**—*Kitasato Arch. of Experim. Med.* 1919. Dec. Vol. 3. No. 3. pp. 199–206. With 1 folding chart.

These experiments were conducted with seventeen strains of *Spirochaeta morsus-muris* (2 human, 1 wild rat and 14 field voles, 4 from Niigata and 10 from Saitama). The examination of 83 field voles (*Microtus montebelli*) showed that the degree of infection was higher in Saitama (54 per cent.) than in Niigata (12 per cent.). All the strains easily infect mice, white rats, wild rats and guinea pigs. The Nippon monkeys, however, react with fever to the human and wild rat strains but not to the field vole strain. That infection had taken place, however, in the latter case was shown by immunological reaction of the inoculated monkeys' blood. The field vole strain is thus less virulent than that of man and the rat.

The authors inoculated monkeys with Niigata strains and Saitama strains of field vole spirochaetes. With the latter, but not with the former, febrile reaction occurred. Immunity tests show that the serum of monkeys that have been infected with a strain of strong virulence (human, wild rat or Saitama field vole) reacts positively against all the strains, whereas the serum from a weak strain (Niigata field vole) has only a slight action against the homologous spirochaete. This, however, is not always true as in one monkey a Saitama strain only gave immunity reaction against its own spirochaete.

C. M. W.

TANOKA (I.). **Cat Bite Disease.**—*Juzenkai Zasshi.* (*Jl. of the Perfection Med. Soc.*). 1918. Feb. 1. Vol. 23. No. 2. pp. 5–12. [From Review by R. G. MILLS.]

The paper records the symptoms of the disease, which is initiated by fever 7 to 10 days after a cat bite. The sites of the bites eventually slough and a scar is left on healing. With treatment by salvarsan a cure is effected in 2 or 3 weeks but the condition may last for several months or even years. A case is reported in which four febrile paroxysms occurred beginning on the seventieth day after the cat bite. Cure was brought about by salvarsan injections.

C. M. W.

IDO (T.), ITO (G.) & WAJI (S.). **Etiology of Seven Day Fever.**—*Tukuoka Ikwa Daigaku Zasshi.* (*Jl. of the Fukuoka Med. College*). 1918. Mar. Vol. 11. No. 1.

[From Review by R. G. MILLS.]

In 1917 (*Journal of the Japan Medical Association*, August, 1917) the authors reported the finding of a spirochete in the blood of a patient suffering from seven day fever, by means of guinea pig inoculation. Morphologically this spirochete resembled the *Spirochaeta icterohaemorrhagiae*. The organism caused a disease in the guinea pig resembling 7 day fever. The blood of the patient contained immune substances toward this spirochete which was found in the kidneys of wild rats in the districts where the disease is prevalent. For these

reasons the authors concluded that it was the etiological agent of this disease, and named it the spirochaete of seven day fever.

At the time of this report the organism had only been obtained in one out of six cases. Since then the authors have found that large guinea pigs are not susceptible to the disease. By using young guinea pigs they have found the same spirochaete in 17 out of 20 cases which they studied. The organism can occasionally be found in smears of the patient's blood, and they are excreted in the urine in large numbers during convalescence.

C. M. W.

Chonishi (S.). **Seven Day Fever in Formosa.**—*Taiwan Igakukai Zasshi.* (*Jl. of the Formosa Med. Soc.*). 1918. Mar. 28. No 185. pp. 427–432.

[From Review by R. G. Mills.]

Detailed report of a case presenting a clinical picture closely resembling jaundice. The serum from the patient, however, showed lytic activity for the spirochetes of seven day fever, and was inactive on haemorrhagic jaundice strains. The diagnosis was based on the serum reaction.

C. M. W.

Erratum.

Vol. 16, No. 3, p. 167, Fry abstract, lines 14 and 15 of text, *for* "In only one of eleven untreated cases did a relapse occur" *read* "In only one of eleven untreated cases did a *second* relapse occur."

YAWS.

GOODMAN (Herman). **Frambesia Tropica (Yaws). A Study of the Literature with Personal Observations, a Critique of its Supposed Identity with Syphilis, and a Bibliography.**—*Arch. Dermat. & Syph.* 1920. July. Vol. 2. No. 1. pp. 7–26. With 8 figs.

A general account of the disease with some good photographs. The author studied ten cases in Panama and Porto Rico. One case was in a hereditary syphilitic child presenting a full-fledged yaws eruption and the Hutchinson triad. A list of 72 references is appended.

A. G. B.

CLAPIER. **Ostéite hypertrophique au cours du pian.**—*Bull. Soc. Path Exot.* 1920. Apr. 14. Vol. 13. No. 4. pp. 315–324.

The author begins by admitting that the framboesial origin of the lesions he describes is not generally accepted, and he draws attention to BOTREAU-ROUSSEL'S observations on the Ivory Coast, who attributes goundou to yaws and considers that disease to be one of the manifestations of a hypertrophic osteitis [see this *Bulletin*, Vol. 10, p. 238]. He is unable, moreover, to produce any experimental proof of the correctness of his views. In the course of 20 months he examined more than 600 yaws patients on the right bank of the Ubanghi river, a forested region where the disease flourishes. The bone lesions appear when the yaws has been generalised for some months, and more often when the papules are subsiding.

Goundou was met with 12 times, but in numerous instances there was slight hypertrophy in this region, of all grades down to the normal. The proportion, he notes, to the total cases is not high.

Osteitis of short bones.—Goundou is an example. Other sites were the shoulder blade, the trapezium, the scaphoid. These hypertrophies are often more apparent to palpation than to inspection.

Osteitis of epiphyses of the long bones.—This is much commoner than goundou. In the upper limb its most usual site is the elbow, where in consequence of the thickening the patient becomes unable to extend his forearm fully. Similarly in the lower limb the knee is most often affected, giving the appearance of a bell-clapper (*battant de cloche*). The thickening at the lower ends of the tibia and fibula is sometimes such that the instep is obliterated.

Osteitis of the diaphyses of the long bones.—The leg bones may present changes in their length, thickness or form. The tibia is curved like a sword blade and its crest is blunted. The humerus and ulna are often slightly curved with the concavity forwards. The phalanges become spindle-shaped, suggesting spina ventosa.

These bony changes are found in various combinations in different subjects. They are always accompanied by muscular atrophy, and are nearly always painless. They entail various physical restrictions : limitation of the visual fields in goundou, limitation of the movements of the elbow, changes in the balance of the body and in the gait. Many

native recruits were exempted in the war owing to a bad conformation of the lower limbs, as the author believes of framboesial origin. He estimates for the Ubanghi river that bony lesions appear in every tenth case of yaws, and become more or less permanent in every twentieth. He goes on to discuss their relation to yaws and gives details of 14 cases.

A. G. B.

Cassar (A.). **Etude d'un cas de pian (framboesia tropica).**—*Ann. de Dermat. et de Syph.* 1919. Dec. 5 series. Vol. 7. No. 12. pp. 462–470.

The patient was an Annamite labourer at work at a powder-mill at Toulouse. The lesions, many of which were raspberry-like, are described with much detail. The diagnosis of yaws was confirmed by the finding of the *Treponema pertenue* in the fluid expressed from one of the lesions. There was a strong Bordet-Wassermann reaction in the blood, none in the cerebro-spinal fluid ; 10 cc. of crystal clear fluid was withdrawn ; an abundant and almost pure lymphocytosis was noted, with the presence of albumin. Details of the histology of an excised papule are given. 10 cc. of the patient's blood was injected into the heart of a guinea pig with a negative result. With suitable technique a small fragment of a lesion was introduced into the testis of one rabbit and into the anterior chamber of the eye of another. In each case the fragment was absorbed and the B.-W. reaction was negative. The patient was treated with five intravenous injections of novarsenobenzol ; after the fourth the B.-W. reaction was slightly positive, but after the fifth negative. There was still a slight lymphocytosis.

A. G. B.

Gastou. **Cas de pian chez un travailleur colonial annamite.**—*Bull. Soc. française de Dermat. et de Syph.* 1920. Feb. 12. No. 2. p. 66.

The patient presented himself at a hospital in France for a lesion of the ala nasi encroaching on the mucosa. It was ginger-bread coloured, a papillomatous vegetating mass, little raised, without crusts or suppuration. It was painless and had been present for an indefinite number of months. There was no other lesion. A "biopsy" revealed a considerable thickening of the horny layer, and nodules of infiltration clearly circumscribed and of lymphoid appearance scattered in the papillary layer. By the use of Levaditi's method spirochaetes having the character of the yaws spirochaete were seen. There was a positive Bordet-Gengou reaction.

A. G. B.

Stephenson (C. S.). **Yaws ; with Report of a Case which Developed in a Temperate Climate.**—*Milit. Surgeon.* (Navy Number). 1920. Sept. Vol. 47. No. 3. pp. 344–347. With 1 plate.

An American, who had been in Haiti and the Central American States in 1917, came on the sick list at Brest in December 1919 with headache, fever, and sores on various parts of his body. In January 1920 he was transferred to the U.S.A. with the diagnosis of impetigo contagiosa.

" On admission, January 14, 1920, he presented the following crusted, circumscribed and pustular, foul-smelling lesions : one on the forehead,

one on the top of the head, of one month's duration, two that looked very much like ringworm of the scalp located on the occiput. These he had for about three weeks. One at the peno-scrotal junction of about two weeks duration. The most interesting were those at the frontonasal junction and one on the chin. They were both granulomatous and not unlike a fig, both for colour and consistency. The one on the forehead was about the size of a small strawberry and bled easily when examined."

The Bordet-Wassermann reaction was 4 plus in all antigens. The treponema was found in serum from the lesions. Arsephenamine and salicylate of mercury were given intravenously once a week. After the third dose there was a chill and parasites of tertian malaria were found. After 4 doses the B.-W. reaction was still 4 plus. After 3 more doses it became negative. Biopsy reports follow ; they confirm the diagnosis of yaws.

The author notes that almost two years had elapsed since the patient had been in a country where yaws was endemic, and that the disease developed in the winter, when transference by flies was improbable. The most likely source of infection was a barber's shop where he was regularly shaved and which was patronized by French Colonial troops. The sore on the chin was the first lesion seen. It is also noted that this was the patient's first attack of malaria, developing two years after service in the tropics and following three doses of arsephenamine.

A. G. B.

Noronha (A. J.). **A Case Resembling Yaws.**—*Indian Med. Gaz.* 1919. May. Vol. 54. No. 5. pp. 178–179. With 1 plate.

The case was that of a Hindu lad, aged about 15, who had spent all his life in Bombay and neighbourhood. He had condylomata about the anus and scrotum and raised yellowish patches on the forehead, lips, trunk and extremities, besides an ulcer on the ankle which was said to have preceded the eruption. The eruption began to clear up after a dose of arsenobenzol. The Bordet-Wassermann reaction was positive. The author inclines to the diagnosis of yaws, but states that indigenous yaws in India is unknown. Dr. Powell, Professor of Medical Jurisprudence, Bombay, who saw the patient, believed him to have syphilis. Yaws, he states, has been common in a district of Assam for more than twenty years.

Two photographs which accompany the paper do not assist the reader to a diagnosis.

A. G. B.

Burga (Buenaventura). **Nueva contribución clinica para el estudio del pian, conocido en el Perú con el nombre de cuchipe.** [New Clinical Contribution to the Study of Pian, known in Peru under the name of "Cuchipe."]—*Cronica Méd.* Lima. 1920. Feb. Vol. 37. No. 680. pp. 72–77. With 2 text-figs.

A description of the disease known in Peru as "Cuchipe," illustrated by photographs and by two clinical histories. The author maintains that the disease is identical with "Pian" or framboesia. His description of it and the two plates appear fully to bear out his contention.

F. S. A.

Spittel (R. L.). **Intravenous Injections of Arsenious and Mercuric Iodides in Syphilis and Yaws.**—*Practitioner.* 1918. Oct. Vol. 101. No. 4. pp. 212–215.

The discovery of salvarsan, the author points out, has demonstrated the value of administration of drugs to the point of tolerance by the intravenous route in the treatment of constitutional disease. Two formulae are given, the second of which appears to be recommended :—

Mercuric iodide,	grs.	50
Arsenious iodide,	grs.	40
Sodium iodide,	ʒ	8
Aq. dest.,	℥	40

" 8 to 15 cc. is the dose for an adult. The dose should be small to begin with and gradually increased according to tolerance. Four to six injections at intervals of four days to a week constitute a course. Several such courses should be given, with intervals of a month or six weeks between them. The injection is administered with a 20 or 30 cc. glass syringe, into which the required quantity of solution is drawn ; the syringe is then filled up to its full capacity with sterile water."

Yaws is greatly benefited as well as syphilis. Cod liver oil and iron should be given at the same time.

" The moist framboesiform papules of *secondary* yaws are rendered dry and heal under their scabs, but not quite as quickly as with salvarsan. The pains in the joints and bones quickly disappear. In *tertiary* yaws recent and painful nodes become painless and quiescent after one or two injections. But nodes that have existed for months, it may be for years, are not reduced with anything like the same rapidity—the same is true of salvarsan ; repeated injections eventually cause the disappearance of many of these.

" The reduction of mercury dosage in the treatment of yaws is perhaps advantageous, for the drug does not exert the same beneficial influence as in syphilis. Iodide is the drug *par excellence* in yaws."

It is not claimed that these injections should replace salvarsan, but they suffice to bring about a cure, and several hundreds can be given at the cost of one dose of salvarsan.

[A. G. B.

REVIEWS.

ELLIOT (Robert Henry) [M.D., B.S. (Lond.), Sc.D. (Edin.), F.R.C.S., Eng., Lt.-Colonel, I.M.S. (Retired).] **Tropical Ophthalmology.**— xxiii + 525 pp. With 7 coloured plates and 117 other illustrations. 1920. London: Henry Frowde & Hodder & Stoughton. (Oxford Medical Publications.) [Price 31*s.* 6*d.* net.]

The appearance of this work, the first of its kind, will be hailed with satisfaction alike by students and young practitioners with tropical service before them but experience still to be acquired, and by those now bearing the heat and burden of the day to whom tropical ophthalmology, varying in amount with locality, opportunity, and personal and special aptitude, represents either the whole or part of the allotted daily task. To others, retired, "climate-wearied," and now perhaps out of touch with the special department of practice dealt with in the book under review, will come a feeling of regret that their labours should have been carried on and brought to a close without the help and guidance now provided for their more fortunate successors by a teacher and writer of out-standing ability, with many years of tropical residence and special experience behind him.

The work is dedicated to the students of the London School of Tropical Medicine, past, present, and future. The reviewer as a past student may perhaps be permitted to take upon himself to acknowledge the compliment on behalf of those up to the present concerned. In due course the future also will speak with no uncertain voice.

In his Preface the author lays stress upon the waste of time, energy, power, and ability which has hitherto unfortunately resulted from the absence of a monograph on Tropical Ophthalmology, and with characteristic modesty explains his reasons and motives for undertaking to supply the want.

The book is conveniently divided into well-arranged sections and these subdivided into parts and chapters :—

(i) This section is introductory and provides reading of absorbing interest both to medical and non-professional readers. In Chapter I the author deals in simple but eloquent language with the principal influences imparting special characteristics to ophthalmic practice in tropical countries. Speaking of India, where his tropical experience was acquired, he dwells in kindly and sympathetic terms upon the poverty, ignorance, and superstition of the great mass of the people, the agricultural population more especially ; upon their suspicion and distrust of foreign agencies, their sensitiveness, and their absolute lack of understanding or appreciation of philanthropic and unselfish motives and ideals ; upon the atmospheric and domestic conditions which favour and foster the prevalence of eye-disease ; and upon the added risks consequent upon the prevalence of malaria, dysentery, and other ailments comparatively rare in most parts of Europe. He tells us also, and this is more cheerful reading, of the complete and unmeasured trust reposed by these same people in those who have won through and obtained their confidence. An enthusiast himself, he touches in enthusiastic terms on the unrivalled field furnished by the tropics for ophthalmological research and practice. His advice to every young surgeon in the tropics to learn to speak fluently the language of the people, to study their customs, to become familiar with their ideas, and thus to develop bonds of sympathy, will be endorsed by all whose work amongst backward native races has been attended with any measure of success. His remarks on the enormous amount of preventable and curable blindness existing in tropical countries, and the consequent urgent and pressing necessity for the multiplication of well-equipped and well-staffed ophthalmic hospitals, deserve and should command the attention of those in administrative authority. In Chapter II the author refers in restrained but suitable words to the pernicious influence of the unqualified native physicians, male and female alike deadly. The drastic nature of

their so-called remedies, the filthy ingredients of these, their no less filthy methods of application, and the ghastly injuries and disabilities so frequently consequent upon their use, are touched upon. The pious words of the son of Sirach—"He that sinneth before his Maker, let him fall into the hand of the Physician"—are fraught with meaning to those who know the tropics. Unfortunately the ministrations of these maleficent and ignorant charlatans are resorted to alike by the innocent and the unworthy, and of this more than one tragic and unhappy illustration is given. Chapter III, which is concerned with a dangerous form of explosive in use in Southern India in the manufacture of "crackers," and ocular injuries thereby produced, is perhaps somewhat out of place in an Introductory Section but unless provided with a section to itself would be difficult to dispose of elsewhere.

(ii) This section treats of the effects of exposure of the eyes to strong light in tropical countries, and includes chapters on injuries of the eyes by lightning, eclipse-blindness, and night-blindness. The information set forth is up-to-date, admirably arranged, and full of interest. Boehm's opinion that eclipse-blindness is rare in myopic eyes is probably in accord with the experience of other observers. Erythropsia and cyanopsia, conditions specially common in the tropics after removal of the lens for cataract and by no means unknown elsewhere, receive separate and careful attention.

(iii) The effects of exposure of the eyes to wind and dust in tropical countries. The author writes feelingly and to some extent in a vein of personal reminiscence, on discomforts endured and miseries suffered under conditions of heat, wind, and dust, impossible to realise by those with experience limited to temperate climates. Chapter II deals with Pinguicula and Pterygium, and for relief of the latter condition, when advanced, McReynold's operation is strongly recommended. Chapter III on the causation of epidemics of ophthalmia in the East though short is one of extreme importance.

(iv) This section is devoted to injuries inflicted on the eye and its appendages by animals in the tropics. The super-abundance of lower animal life, more especially of insect life in these regions, and the dangers run by man in consequence, are dwelt upon. The author explains the paucity of records in literature of eye-trouble from insects and their allies by the fact that men write but little of ordinary everyday occurrences. Mechanical and chemical injuries by insects; septic infection due to insect agency; chemical injuries by other animals; wasp and bee stings; the effects of bites by mosquitoes, ants, ticks, leeches, rats, snakes and other pests all receive detailed notice both with regard to symptoms produced and treatment indicated.

(v) The fifth section describing parasitic diseases of the eye extends to four parts and a total of fifteen chapters. It is exhaustive and complete as far as present knowledge takes us, but many of the chapters are of necessity short and the author on more than one occasion repeats the appeal to tropical practitioners, already set forth in the dedication, to remember the possibilities offered by this field of research and to forward material for investigation to the London School of Tropical Medicine. The chapters on *Loa loa* and on ocular myiasis are of peculiar interest, and the indications for treatment in the latter condition, of which distressing examples are frequently seen in India, are clearly set forth. The chapter on *Filaria bancrofti* is contributed by Dr. P. Manson-Bahr, who appears to be rightly sceptical with regard to the share borne by this parasite in the causation of several conditions enumerated. In Chapter II, Part IV, reference is made to an interesting case of mycetoma recently published in which the orbit was the seat of growth of the fungus responsible.

(vi) This section deals with the Indian operation of couching for cataract, its history, technique, statistics, and pathology. A fuller and even more interesting account of the whole subject will be found in a monograph published by the same author in 1917 and well-known to many readers.

(vii) Devoted to the subject of Cataract Extraction and written with the special object of providing help and guidance to the man commencing ophthalmic work in the East. The author favours for most cases the Capsule-Laceration operation in preference to the so-called Intra-Capsular

operation. There can be few who will not agree with him that the former is easier and safer, and consequently the obvious method for beginners. Chapter V on the Madras Cataract operation is from the pen of Lieut.-Col. H. KIRKPATRICK, I.M.S. It is unnecessary for the reviewer to accompany the writers into the details of case selection, preparation, operative procedure, and after-treatment so admirably and lucidly set forth. Suffice to say that careful and repeated perusal of the chapters of this section will amply repay both the beginner and the more advanced tropical practitioner.

(viii) This section treats, as the author explains, only of those diseases of the conjunctiva, cornea, lids, and lachrymal passages which are peculiar to the tropics, of unusual frequency in tropical regions, or modified either in character or in the nature of the treatment indicated by conditions of tropical environment. Trachoma with its far-reaching complications and disastrous effects; various forms of chronic conjunctivitis; subconjunctival granuloma; varieties of punctate keratitis of uncertain aetiology, but regarded as distinct clinical entities and at present distinguished by their discoverers' names; HERBERT'S corneal plaques; septic ulceration of the cornea, panophthalmitis, and ophthalmic sepsis generally are among the subjects dealt with.

Lachrymal obstruction, by reason of its special prevalence in Eastern countries, receives the particular attention which it deserves. The author recommends the operation of extirpation of the sac as being in most cases preferable and for many reasons more suited to the class of patient seeking relief in India than the older and more conservative methods of treatment. In this opinion most surgeons with recent Indian experience will concur.

(ix) This section is devoted to miscellaneous subjects and includes amongst others, chapters on Glaucoma, new growths, refraction, and hospital management. The author's qualification to speak with high and peculiar authority on the first of these topics is well known and as generally recognised. Whilst on the subject of new growths he records an impression, which will be confirmed by others, that congenital growths and congenital malformations are encountered with unusual frequency in India; he suggests, and probably with reason, the consanguinity consequent upon in-breeding as a very possible explanation, and recommends the subject to the attention of young workers whose years of observation lie before them. The chapter on Hospital Management is an excellent one and may be recommended for study alike by those in charge of medical institutions in the East and by those aspiring to such positions. Lieut.-Col. KIRKPATRICK contributes a useful chapter on ophthalmoscopic appearances in the tropics.

(x) The last and one of the most important sections deals with the ocular signs, symptoms, and complications of general diseases of tropical origin or common in the tropics. The chapter on Beriberi and its eye symptoms is written in collaboration with Professor S. MIYASHITA. That on Yaws is contributed by Dr. SAMBON.

The author is of opinion that the ocular complications of Cholera can be prevented in most cases by washing out the eyes at intervals, and keeping them damp and protected with swabs soaked in normal saline solution. It is to be feared however that in a disease characterised by prolonged and almost complete failure of distal circulation some cases of ulceration and even sloughing are inevitable.

The valuable work done in recent years in connection with the eye complications of Dysentery receives full notice.

On the subject of the general treatment of Leprosy many who have followed with interest the recent therapeutical advances of Leonard ROGERS will express themselves more hopefully than the author; as regards local treatment the latter points out that lepers bear operations on the eye extraordinarily well, and that much may in consequence be done, even in bad cases, to preserve some degree of vision at least temporarily.

The chapters on Malaria and on Quinine poisoning have only to be read to be appreciated. It will be admitted by all that the difficulties experienced by ophthalmologists in distinguishing between true malarial aetiology and grave secondary impairment of health as a causative factor

must often be well nigh insuperable. In discussing the vexed questions of quinine dosage and administration it must be recognised that, however fully practitioner and ophthalmologist may appreciate the possibly serious and sometimes permanent toxic effects of the drug, idiosyncrasy or individual degree of intolerance is often an unknown quantity, whilst gravity of infection and urgency of symptoms may be painfully manifest. Excess of caution may consequently in some cases prove disastrous.

At page 450 the author states that quotidian malaria is a mixed infection. This cannot be taken as accurately expressing his meaning.

Attention is directed to the serious nature of the eye symptoms which may complicate Plague. The author suggests that in this, as in Cholera and other tropical diseases, a possible contributory factor in the production of corneal lesions is exposure of the globe, as the result of ignorance and neglect of the patient.

In the chapter on Trypanosomiasis the eye lesions both in man and animals are described and discussed, and stress is laid upon the important contributions of DANIELS to our knowledge of this subject.

Considerations of space render it impossible, and as a matter of fact it is unnecessary, to enlarge upon the importance of Col. Elliot's work and of the subject with which it deals. The book contains a mass of interesting information conveyed to the reader in attractive form and well-chosen language. The author's style is clear, fascinating, and devoid of bias, and there is a marked avoidance of anything approaching controversy, even when he deals with subjects affording room for extreme divergence of opinion. The work should be in the hands of every surgeon in the tropics, and the reviewer is on safe ground in prophesying that assured success awaits it, that it will run to many editions and become a classic, and that the reputation of its already distinguished author will be enhanced by its production.

The volume is of convenient size, well-printed in clear type and on good paper, no small desideratum at the present time. It is beautifully illustrated, free from printer's errors (the reviewer has discovered only one), and possesses an excellent index. Seven coloured plates, most of which are reproductions of paintings by Lieut.-Col. H. KIRKPATRICK, deserve special admiration. A complete list of references is appended to almost every chapter, and the services of all who have assisted in production are specially and generously acknowledged.

J. J. Pratt.

MEDICAL RESEARCH COUNCIL (Privy Council). Special Report Series, No. 51. **The Laboratory Diagnosis of Acute Intestinal Infections, including the Principles and Practice of the Agglutination Test.**— 155 pp. With 3 plates & 15 text-figs. 1920. London: H.M. Stationery Office. [Price 4*s.* 6*d.* net.]

This report, the 51st of its kind, must be adjudged as one of the most useful and instructive of the series. It will be specially welcomed by the laboratory worker, as representing a more or less rational account of modern bacteriological methods.

It is divided into two parts: the first dealing with the laboratory diagnosis of acute intestinal infections; the second dealing with the principles and practise of the agglutination test with special reference to the recognition of the intestinal bacilli.

In the introduction the Committee upon Pathological Methods (composed of Sir F. W. ANDREWES, Dr. J. G. ADAMI, Professor W. BULLOCH, Captain S. R. DOUGLAS with additional co-opted members, Professor C. H. BROWNING, Professor G. DREYER, Mr. Clifford DOBELL, Dr. J. C. G. LEDINGHAM and Dr. C. G. L. WOLF) express it as their aim "to sift the evidence for and against different methods of procedure, and to state their opinion as to which are best adapted for ordinary laboratory use."

In a consideration of the bacterial flora of the normal intestine, which prefaces the portion dealing with pathogenic organisms, the Committee record that it is a matter of great difficulty to classify the members of the Gram-negative group into definite species; for these the serological criteria fail to be of any service. Mere fermentation tests with solutions of the sugars being no longer of any value, a more exact method is indicated which is not concerned so much with the mere fact of fermentation, but would go deeper into the matter, and by analysing the gas produced, determine the ratio between CO_2 and H_2; it would endeavour to compare the relative production of acetic acid and alcohol and the presence of substances, such as the methyl-carbindol and indol. By these means it can be shown that different species vary in the fundamental nature of their action upon the sugars.

From an analysis of 2,100 coliform bacilli from normal stools, ROBINSON has shown that no striking differentiation is obtained by means of sugar fermentation tests, but that rather stress should be laid upon the indol and carbindol reactions (VOGES and PROSKAUER test): therefore in public health work and in bacteriological examination of water much greater significance should be attached to these than has hitherto been the case.

The opinion is expressed that streptococci often outnumber *B. coli* in the alimentary tract. It is generally admitted that they can be differentiated from *S. pyogenes*, though their numbers are so great that it appears to be useless, in the present state of our knowledge, to attempt to classify them.

After a short consideration of the anaerobic bacilli and the relation of the normal flora of the intestine to disease, the report proceeds to consider the very important subject of the collection of material for laboratory diagnosis.

With regard to the collection of faeces certain wise observations are made. Before proceeding to despatch faecal material to the laboratory for diagnosis, the practitioner should remember that owing to the reactions—acid or alkaline—in various parts of the intestinal canal the maximum bacterial growth is reached in the last two feet of the ileum, but, as the contents of the large intestine become more solid and more acid the number of bacteria decrease, so that for cultural purposes the looser the stools the more abundant bacterial fauna they contain. 1 cc. of a loose motion properly selected and transmitted, as soon as is practicable, is ample for all bacteriological purposes. For these reasons in the search for carriers, a preliminary purgative should always be given.

The container recommended is a wide-mouthed bottle of a familiar type for the preservation of the specimen, and for the prevention of overgrowth by coliform organisms TEAGUE and CLURMAN'S method—the addition of double the volume of a 30 per cent. glycerine in 0·6 per cent. saline—is recommended. Attention is drawn to the Post Office regulations with reference to the transmission of specimens of this nature. As regards urine, the specimen should, whenever possible, be collected by means of a sterile catheter.

In making blood cultures it is recommended that at least 10 cc. should be withdrawn; this quantity, which at first sight seems rather excessive, is required for duplicating the cultures, so that some can be incubated under anaerobic conditions.

The instructions given for the collection of blood are extremely elaborate, though in actual practise the procedure is very simple. In preparing the actual culture, due regard should be paid to the bactericidal power of the sera, the inhibitory action of blood plasma, the phagocytic properties of the leucocytes, as well as to the coagulation of the blood which precipitates the contained organisms. In the culture of enteric bacilli, the greater the dilution of the blood in the nutrient broth, the better the chances of successful isolation; one obvious disadvantage of the method is the very large amount of medium necessary. Bile is useful in counteracting the antibacterial substances in the blood. An important advance in blood culture work has been made by the addition of trypsin to the broth (DOUGLAS & COLEBROOK); this ferment destroys antibacterial bodies and inhibits the clotting of the blood. This method is specially useful in transmitting blood specimens through the post for culture.

Minute instructions are given for the culture of faeces and the best methods of spreading the plates; the brilliant green enrichment method is

specially recommended in this branch of work. The incidence of the enteric group of bacilli in the faeces is an important practical point; it is stated, for instance, that the maximum incidence of paratyphoid bacilli in the stools occurs earlier than in *B. typhosus* infections: paratyphoid A generally appears on the twelfth day; paratyphoid B at the end of the second, or beginning of the third week.

Ample space is devoted to the section on specific diagnosis of the various bacterial infections; the information is ample and does not depart in any striking manner from the usual teaching upon this subject; we may note, however, that a reliable table of the fermentation reactions of the typhoid-paratyphoid group is given. It is recommended that, if at the end of 24 hours an organism appears to conform to one of the specific pathogenic types, the agglutination reaction be tested without further delay, but the fermentation tubes should be incubated for at least a week before making the final readings.

It is of practical importance to differentiate weak fermentative characters which may be manifested by recently isolated organisms, and *mutation*, involving the acquisition of power to act on a given substance after more or less prolonged growth on medium containing the particular carbohydrate or alcohol.

In the section dealing with bacillary dysentery, stress is rightly laid upon the necessity of employing some simple medium, such as lactose agar tinted with litmus, rather than one containing any inhibiting reagents so far no satisfactory enrichment method, such as the use of brilliant green in the case of the enteric group, has been discovered, but cultures should be made as soon as possible after the passage of the stools. In no case should the interval be longer than six hours. Should delay be inevitable Dudgeon's method (mixing with an equal volume of $\frac{N}{33}$ Na OH solution) is recommended. The method of plating out the faeces necessarily varies in different stages of the disease, as the stools assume a diff rent consistency.

This section of the report contains a useful summary of the present state of our knowledge of the bacteriology of this disease which is necessarily based upon the recent work of Andrewes and Inman on the serological races of Flexner's bacillus. The paragraphs dealing with acute food poisoning, and the closely related organisms of the Aertrycke, *enteritidis*, *suipestifer*, and *paratyphosus B* groups, Morgan's bacillus, *B. pyocyaneus* and *B. proteus* are also briefly mentioned, as possible causes of outbreaks of diarrhoea.

The section dealing with cholera epitomises recent advances in our knowledge of this important subject, and we are pleased to note that the employment of distinctly alkaline peptone water is advocated as being the most efficient medium for the successful isolation of the vibrio.

As points in the identification of *V. cholerae* we note that the serological reactions are considered of greater importance than are the biochemical tests for this organism. *The final diagnosis has always to be made by serum tests alone.*

The vexed question of serological types of *V. cholerae* is reviewed in detail. Recent investigations, by one member of the Committee, with a view to elucidating this question, have suggested that all true *V. cholerae* strains belong to one serological race. One might, therefore, be permitted to criticize the wisdom of quoting in detail all the paracholera vibrios which from time to time have been described by investigators, using widely different technique. Some have been isolated but once or twice. It is suggested that the paracholera vibrios, which are held to be responsible for outbreaks of choleraic diarrhoea, represent intermediate phylogenetic links between the true cholera vibrios and those recovered from water, shell fish and from many other sources. These paracholera vibrios have no serological affinities with the true cholera vibrio, though, as Mackie & Storer have shown, they may form serological groups among themselves.

The Diagnosis of Dysentery due to Animal Parasites is naturally devoted chiefly to a consideration of amoebic dysentery. Here one can detect the hand of Professor Dobell. It is in this section that we note the timely and descriptive term "amoebic diarrhoea" applied for the first time; every one who has had a recent experience of amoebiasis of the intestinal

canal will fully appreciate the appropriateness of this expression. The advice that it is of the utmost importance to examine the stool as soon as possible after passage, is applicable to the amoebic, as it is to the bacillary disease.

It is important too that the bed-pan, or other utensil into which the stool is passed, should be free from antiseptics and dry, as even water kills the entamoebae.

In examining chronic cases it is important to remember that the amoebae are often unevenly distributed throughout the mucus present in the motion.

When the examination is made for the diagnosis of "amoebic diarrhoea" it is the precystic and cystic stages of *E. histolytica* which are especially sought for. The cystic stage is the one most easily recognized, but the precystic is the more difficult. Therefore the administration of purgatives should be avoided, as liquid stools contain chiefly precystic forms.

Very full instructions are detailed for the preparation of stained and permanent specimens, both of vegetative entamoebae and the cysts and for the differential diagnosis between *E. histolytica* and the other non-pathogenic intestinal amoebae. Probably the information contained in this section cannot be obtained at present from any other source and its value is not detracted from by the valuable homily upon the value of positive and negative examination for the presence of *E. histolytica* in the faeces with which it ends. These lines should be read and inwardly digested by all those who have to treat diarrhoea and dysentery in and out of the tropics. Three artistic plates of amoebae and *Balantidium coli* illustrate this subject.

The second portion of the report dealing with the principles and practise of the agglutination test is extremely full and detailed. It concerns itself mostly with the painstaking and detailed work of Professor DREYER and the elaboration of his particular technique. It is extremely doubtful whether one can attempt to compress any idea of the information it contains into an adequately small space. We may note that Dr. LEDINGHAM is not associated with the subject-matter of this section.

The impression gained from a perusal of the work is that the subject of agglutination has become so extended that it should only be attempted by the experienced laboratory worker, and in fact removed from the realm of practical medicine altogether. This is not the impression which is meant to be conveyed, but one would suggest that the main value of serum-agglutination is the aid it affords in the *diagnosis of disease*; therefore, the more simple, reliable and rapid the technique the more practical its application.

Anyone who has worked with DREYER'S technique in a military laboratory, under stress, will appreciate the impracticability of carrying out a large number of tests at the same time. These objections were to a great extent removed and the practicability of agglutination tests, without detriment to reliability, extended, by the introduction of GARROW'S agglutinometer. We must take exception to the statement that this method of macroscopic agglutination may represent a possible error of 100 per cent. We are inclined to regard this statement as liable to prejudice the method in the eyes of those who have not utilised it. It is a statement which no one who has employed the method in a practical manner on an extensive scale would admit. From the point of view of diagnosis the results are quite as reliable as the tube method. For instance, if after incubation, tubes register an agglutination of 1 : 160 and the agglutinometer 1 : 80 this can hardly be regarded as an error of 100 per cent.

We have been able recently to make a serological diagnosis of undulant fever in two cases in which an agglutination of 1 in 720 was obtained in 10 minutes by the method. What one would like to question is, whether this diagnosis would have been in anyway altered by a macroscopic agglutination in tubes which would have taken about 8 hours to perform and might have shown a slightly higher titre?

Details are given of the preparation of bacterial suspensions, the manufacture and use of pipettes, and the gradation by means of the Morse gauge and DONALD'S method of measuring minute quantities by means of drop pipettes is heartily advocated.

The latter portion of the work is replete with excellent material and is necessarily heavy reading ; it is full of minutiae regarding the preparation and standardization of agglutinable cultures, the technique of the absorption test and the preparation of agglutinating sera in laboratory animals—all most valuable information to the laboratory worker. Instructions of such first-rate importance are not easily obtained in any other publication within our knowledge.

Philip Manson-Bahr.

The Director will be glad to hear from any reader who is prepared to undertake the summary or review of papers or monographs in European languages other than English and French.

Reprints and Pamphlets received :—

BASSETT-SMITH (P. W.). Scurvy : with Special Reference to Prophylaxis in the Royal Navy.—Reprinted from *Proc. Roy. Soc. Med.*, 1920. Vol. 13. (War Section). pp. 51–69.

BEDFORD (G. A. H.). Ticks found on Man and his Domestic Animals and Poultry in South Africa.—Reprinted from *Jl. Dept. Agric.*, 1920. July. 26 pp. 1920. Pretoria : The Government Printing & Stationery Office.

CHALMERS (Albert J.) & KAMAR (A.). *Toxoplasma Pyrogenes* Castellani 1913.—Reprinted from the *Jl. Trop. Med. & Hyg.*, 1920. Feb. 16. p. 45. With 1 plate.

CHALMERS (Albert J.) & MACDONALD (Norman). Some Cosmopolitan Sudan Skin Affections. 1. Herpes Iris.—Reprinted from the *Jl. Trop. Med. & Hyg.*, 1920. June 15. pp. 150–152. With 1 plate.

DARLING (S. T.). Suggestions for the Mass Treatment of Hookworm Infection.—Reprinted from the *Lancet*. 1920. July 10. pp. 69–72.

DARLING (Samuel T.). Experimental Inoculation of Malaria by Means of *Anopheles ludlowi*.—Reprinted from the *Jl. Experim. Med.*, 1920. Sept. 1. Vol. 32. No. 3. pp. 313–329.

FARGHER (R. G.). The Role of Antimony in Tropical Medicine.—Reprinted from the *Jl. Soc. of Chemical Industry*, 1920. Oct. 15. Vol. 39. No. 19. pp. 333r–4r.

FREDERICK (Robert C.). The Conversion of Air into a Lethal Mixture of Gases by Storage of Tobacco and other Vegetable Substances.—Reprinted from the *Jl. of Hyg.*, 1920. Oct. 26. Vol. 19. No. 2. pp. 205–207.

HALL (Frederick). The Leper Asylum of Makogai, Fiji. A Short Description of the Island and Leper Station.—10 pp. With 9 plates. 1920 : Suva. By Authority J. J. McHugh, Acting Government Printer.

PINO-POU (R.). Nota preliminar sobre el primer caso humano de Espiroquetosis Ictero-hemorrágica señalado en Venezuela.—18 pp. 1920. Caracas, Venezuela : Tip. Americana.

TODD (John L.). The Granules of *Spirochaeta duttoni*.—Reprinted from *Bull. Soc. Path. Exot.*, 1919. Nov. 12. Vol. 12. No. 9. pp. 595–600.

TODD (John L.). Latent Infection in Experimental Spirochaetosis.—Reprinted from the *Proc. Soc. Experim. Biol. & Med.*, 1920. Jan. 21. Vol. 17. No. 4. pp. 83–84.

WALKER (J. T. Ainslie). Intestinal Disinfection. With a Note on its Practical Attainment.—12 pp. 1920. London : The Universal Medical Periodicals, Ltd., 36–38, Whitefriars Street, E.C. 4. [Price 6*d.* net.]

Note.—On direct application (not through agents or booksellers) any of the foregoing reprints or pamphlets will be sent on loan to any part of the world, the Bureau paying outward postage.

Books received.

BUSHNELL (George E.). [Ph.D.. M.D.]. A Study in the Epidemiology of Tuberculosis with Especial Reference to Tuberculosis of the Tropics and of the Negro Race.—221 pp. 1920. New York: William Wood & Co. [Price not stated.]

HUNTINGTON (Ellsworth). Civilisation and Climate.—xii × 333 pp. With 38 text figs. 1915. New Haven: Yale University Press. London: Humphrey Milford, Oxford University Press. [Price 12*s*. 6*d*. net.]

Reports received.

BOMBAY: Report of the Bombay Bacteriological Laboratory for the Year 1919. [LISTON (W. Glen.), Director.]—14 pp. F'cap. 1920 Bombay: Govt. Central Press. [Price 3 annas.]

COONOOR: The Pasteur Institute of Southern India, Coonoor. The Annual Report of the Director together with the 13th Annual Report of the Central Committee of the Association for the Period ending 29th February 1920.—25 pp. 8vo. 1920. Madras: Govt. Press.

MADRAS: Annual Report and Statistics of the Government General Hospital, Madras, for the Year 1919.—71 pp. F'cap. 1920. Madras: Govt. Press.

TRINIDAD & TOBAGO. Lepers. Report of the Committee Appointed to Consider and Report onthe Question of Providing Better Accommodation for Lepers in the Colony.—18 pp. 1919. Council Paper No. 24. Port of Spain. Printed at the Govt. Printing Office. [Price 8*d*.]

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